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U.S. ARMS CONTROL AND DISARMAMENT AGENCY 1987 ANNUAL REPORT

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

THE 26TH ANNUAL REPORT OF THE U.S. ARMS CONTROL AND DISARMAMENT AGENCY, COVERING CALENDAR YEAR 1987, PURSUANT TO SECTION 50 OF THE ARMS CONTROL AND DISARMAMENT ACT, AS AMENDED (75 STAT. 639, 89 STAT. 760)

TOGETHER WITH

ADDITIONAL REPORTS SUBMITTED PURSUANT TO REQUIREMENTS OF THE ARMS CONTROL AND DISARMAMENT ACT OF 1961, AS AMENDED

MAY 1988

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FOREWORD

For more than 26 years, the United States Arms Control and Disarmament Agency (ACDA) has had the lead responsibility within the federal bureaucracy for the furtherance of arms control and disarmament efforts. To this day, it remains the only independent government agency in the world with such a charter.

Despite recurring problems of personnel shortages, high turnover in leadership positions, budgetary difficulties, and limited bureaucratic power, the Agency has endured and has been centrally involved in significant arms control achievements, particularly in its early years. A reading of this annual report provides reassurance that ACDA is currently working to bring about significant agreements in some major areas, including the Nuclear and Space Talks, the negotiations on a chemical weapons ban in Geneva, and with regard to the conventional stability talks in Geneva. Certainly, ACDA has made a strong contribution in the field of nuclear nonproliferation.

We and others have taken steps over the years to strengthen ACDA. We intend to have the Senate Committee on Foreign Relations and the House Committee on Foreign Affairs take a fresh and close look at the Agency in the next Congress to assess how well the Agency is fulfilling its charter, what more it should be doing, and what it needs to improve. Fortunately, ACDA retains a solid core of professionals who are well versed in arms control issues. We intend to see that ACDA builds upon the present base to come closer to attaining its potential.

The Intermediate-Range Nuclear Forces Treaty was a major political achievement in 1987. We hope that the Agency and other elements of the executive branch will be able to make substantial progress in several important areas of arms control so that a new Administration will be able to move ahead with vigor.

High priority should be given to nuclear testing controls. The two nuclear experiments agreed to by the United States and the Soviet Union should contribute to the resolution of verification issues surrounding 1974 Threshold Test Ban Treaty and the 1976 Peaceful Nuclear Explosions Treaties. We wish President Reagan every success in reaching a workable agreement on new verification protocols so that before this Administration leaves office the President will support ratification.

When the Threshold Test Ban and Peaceful Nuclear Explosions Treaties are ratified we intend to push hard for early agreement to reduce substantially the permitted yields and the numbers of tests. We should be able to marshal the necessary support to reduce the ceiling from the present 150 kilotons to about 10 kilotons—a level that could be monitored with high confidence. We could then move

down to 1-2 kilotons, and on to a level below that. A complete ban can be achieved when it is quite clear that our monitoring and agreed restrictions are good enough to ensure that no cheating is possible that would outweigh the advantages of a ban.

We hope very much that the new Administration will be convinced of the merits of negotiating a new treaty that moves us steadily toward the early achievement of a complete ban. The new Administration should understand the vital importance of moving forcefully so that we can curb the development of new weapons, decrease our reliance upon nuclear weapons, and show other potential nuclear weapons states that we are serious about halting nuclear weapons tests.

Let us turn now to some other issues in arms control. The success of the INF Treaty underscores my belief that there is solid basis for hope that arms control is getting back on track.

Another top priority is START, or Strategic Arms Reduction, which is currently being negotiated in Geneva. If this negotiation succeeds, it will lead to the first deep cuts in the arsenals of the superpowers, and will be of great military significance. Both sides owe it to the world not to fail.

Third, to reinforce nuclear limits and to make certain that these limits do not merely make the world safe for conventional war, high priority must also go to negotiation of deep reductions in conventional forces in Europe. Such reductions would complement and reinforce the achievements of the INF Treaty by reducing the prospect of a war in Europe and make it still more unlikely that the sides would ever use nuclear weapons.

A fourth top arms control objective should be a ban on the production, storage, and possession of lethal and incapacitating chemical weapons. The use of chemical weapons in the Middle East demonstrates anew that there are nations that have and will use them. There is agreement in principle on a ban on such weapons at the Conference on Disarmament in Geneva, and agreement is possible, if not this year, then early in the next Administration. The Geneva Protocol of 1925 banned the use of such weapons as a reaction to the terrible gas warfare of World War I. Now, more than 60 years later, there appears a real prospect of a multinational agreement to ban not only the use but also the production of such weapons.

There will be many obstacles along the way to the test ban and other arms control, not the least of which is that, as a society, we are attuned to the making and amassing of weapons. We are less ready and less skilled at the elimination of weapons than at producing them. Much of what must be accomplished will go against the grain of history. Nonetheless, there are opportunities waiting to be seized if there is the will to see those opportunities and to act.

This year, for the first time, we are printing in this volume two reports which the Agency was required to submit to the Congress pursuant to amendments to the Arms Control and Disarmament Amendments Act of 1961, as amended. We are taking this step to ensure the wider availability of these reports. As in the past, the views expressed in these reports, as in the annual report, reflect the views of the Administration and the Arms Control and Disarmament Agency, and do not necessarily reflect the views of the

Senate Committee on Foreign Relations or the House Committee on Foreign Affairs.

CLAIBORNE PELL,
Chairman,
Senate Committee on Foreign Relations.

DANTE B. FASCELL,
Chairman,
House Committee on Foreign Affairs.

LETTER OF SUBMITTAL

U.S. ARMS CONTROL AND DISARMAMENT AGENCY,
January 26, 1988.

MR. PRESIDENT: I am pleased to submit for your transmittal to the Congress, as required by the Arms Control and Disarmament Act (22 U.S.C. 2590), this twenty-seventh Annual Report of the United States Arms Control and Disarmament Agency.

Sincerely,

DAVID F. EMERY,
Acting Director.

Enclosure.

LETTER OF TRANSMITTAL

FEBRUARY 24, 1988.

To the Congress of the United States:

I am pleased to transmit the 1987 Report of the United States Arms Control and Disarmament Agency. It reviews the negotiation process used in achieving the INF Treaty and contains a copy of the Treaty itself. That Treaty, signed by General Secretary Gorbachev and me on December 8, is the first treaty of the nuclear era requiring the elimination of an entire category of U.S. and Soviet nuclear weapons.

The Report provides information about the ongoing negotiations for a 50-percent reduction to equal levels in U.S. and Soviet strategic nuclear offensive arms, an effective and verifiable ban on chemical weapons, and the correction of disparities in conventional forces. Also described are the ancillary activities of the Arms Control and Disarmament Agency in support of our arms control policies and, concomitantly, the security of the United States.

The INF Treaty constitutes a breakthrough in verification, the most far-reaching in the history of arms control, and should serve as a guide for other treaties to come. The political and economic advantages of carefully negotiated and effectively verifiable arms reductions hold great promise for peace, security, and continued prosperity for our country. The 1987 record of progress toward those goals is contained in this 27th ACDA Report.

RONALD REAGAN.

THE WHITE HOUSE.

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EXECUTIVE SUMMARY

The culmination of much of the arms control activity during 1986 and 1987 occurred in December 1987, when President Reagan and General Secretary Gorbachev met in Washington to sign the Intermediate-Range Nuclear Forces (INF) Treaty and to discuss other arms control negotiations. Not only was the event of December 8 the first Washington Summit in 15 years but it also heralded the signing of the first arms control treaty to result in the elimination of an entire category of nuclear missiles under conditions of the most far-reaching verification regime in the history of arms control.

The INF Treaty was negotiated by one of three sets of United States and Soviet arms control delegations working under the Nuclear and Space Talks (NST) umbrella; the other two sets are the Strategic Arms Reduction Talks (START) and Defense and Space (DST) delegations. Much of the backstopping and analytical support for the United States delegations was provided by ACDA. Forward movement in the negotiation process for INF and START during the year depended to a great extent on direct involvement at the foreign minister and head of state levels. For example, progress made during the first half of the year was influenced by the Reykjavik Summit and the Shultz-Shevardnadze meetings of April 13–15 in Moscow; in the second half of the year by the Shultz-Shevardnadze meetings of September 15–17 in Washington and October 22–23 in Moscow, and the Washington Summit of December 7–10. Emerging from the Washington Summit was a mutual understanding for the completion of a START Treaty encompassing a 50 percent cut in strategic offensive weapons, with a limit of 1,600 strategic nuclear delivery vehicles (SNDVs) and 6,000 warheads on those delivery vehicles.

Other bilateral arms control negotiations during the year involved Nuclear Risk Reduction Centers and Nuclear Testing. Also taking place during the year were United States-Soviet arms control expert-level meetings on chemical weapons, the Biological and Toxin Weapons Convention, and nuclear nonproliferation. Finally, the Standing Consultative Committee held two 1987 sessions. The chronology for bilateral negotiations follows:

Nuclear and Space Talks Round VII, January 15–March 6 (INF continued to March 26); Round VIII, April 23–December 7 for INF (START and Defense and Space began May 5).

Nuclear Risk Reduction Centers Round I, January 13; Round II, May 3–4.

Nuclear Testing Round I, November 9–20.

The chronology for arms control expert-level meetings during the year follows:

Chemical weapons treaty talks, February 16–March 5 and July 20–August 7. Chemical weapons nonproliferation discussions, October 7–8.

Biological and Toxin Weapons Convention meeting, March 31–April 15.

Nuclear testing experts Fourth Session, January 22–March 20; Fifth Session, May 18–29; Sixth Session, July 13–20.

Nuclear nonproliferation talks, July 28–30.

Standing Consultative Commission Round XXXIII, March 8–April 7; Round XXXIV, September 16–November 5.

The most significant event for multilateral arms control during the year was the first year's implementation of the Stockholm confidence-building measures, under which 43 military activities were notified and five on-site inspections of military activities were conducted. Conventional arms control received a great deal of impetus at the Conference for Security and Cooperation in Europe (CSCE); the 23 member states of NATO and the Warsaw Pact met in Vienna January 27–April 11, May 4–July 31, and September 22–November 21. NATO and Warsaw Pact countries agreed to the discussions on a mandate for future conventional stability and the elimination of disparities in conventional forces in Europe. In that context, Mutual and Balanced Forces Reduction (MBFR) delegations met in three rounds; no progress was made in resolving disputes.

The Conference on Disarmament (CD) held its usual annual session, February–August with a month's recess during the month of May. Ad hoc committees on the following agenda items were established: chemical weapons, prevention of an arms race in outer space, international arrangements to assure nonnuclear states against the use of nuclear weapons, new weapons of mass destruction, and a comprehensive program of disarmament. Most of the CD's work centered on chemical weapons. President Reagan again addressed the United Nations General Assembly in September and the United States introduced two resolutions (arms control compliance and condemnation of the illegal use of chemical weapons) in the UN First Committee.

The sixth report on Soviet noncompliance, sent by President Reagan to the Congress on December 2, reaffirmed previous United States findings of Soviet noncompliance with treaty obligations and reported one additional ABM Treaty violation, namely, the movement early in 1987 of major parts of a Flat Twin radar and a Pawn Shop missile guidance transmitter from Sary Shagan Missile Test Center to an electronics plant in Gomel.

The ACDA nuclear nonproliferation staff continued their efforts during the year to strengthen all elements of the nonproliferation regime, particularly the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and the International Atomic Energy Agency (IAEA).

Research and analysis in support of negotiations and in accordance with the ACDA statute continued. Some of the areas investi-

gated were the economic impact of arms control treaties, Soviet military expenditures, the evaluation of the capability of nuclear forces, nuclear test ban monitoring, and crisis stability issues.

Arms Control Update, a monthly newsletter on arms control issues, was added to ACDA's established publications.

ABBREVIATIONS AND ACRONYMS

ABM	Antiballistic Missiles
ACDA	Arms Control and Disarmament Agency
ACIS	Arms Control Impact Statements
ALCM	Air-Launched Cruise Missile
ASAT	Antisatellite
BWC	Biological Weapons Convention
CBMs	Confidence-Building Measures
CD	Conference on Disarmament
CDE	Conference on Confidence- and Security-Building Measures and Disarmament in Europe
CSBMs	Confidence- and Security-Building Measures
CSCE	Conference on Security and Cooperation in Europe
CTB	Comprehensive Test Ban
CW	Chemical Weapons
DST	Defense and Space Talks
ENMOD	Environmental Modification Convention
GAC	General Advisory Committee
GCC	Gulf Cooperation Council
GLCM	Ground-Launched Cruise Missile
HEU	High-enriched Uranium
IAEA	International Atomic Energy Agency
ICBM	Intercontinental Ballistic Missile
INF	Intermediate-Range Nuclear Forces
LRINF	Longer-Range Intermediate-Range Nuclear Forces
LTBT	Limited Test Ban Treaty
MBFR	Mutual and Balanced Force Reductions
NATO	North Atlantic Treaty Organization
NNA	Neutral and Non-Aligned Countries
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NRRC	Nuclear Risk Reduction Centers
NTEM	Nuclear Testing Experts Meeting
NST	Nuclear and Space Talks
NTM	National Technical Means
NWFZ	Nuclear Weapons Free Zone
PNET	Peaceful Nuclear Explosions Treaty
POTAS	Program for Technical Assistance to IAEA Safeguards
PUNE	Peaceful Uses of Nuclear Energy
RECOVER	Remote Continual Verification
RERTR	Reduced Enrichment in Research and Test Reactors
RV	Re-entry Vehicle
SALT	Strategic Arms Limitation Talks
SCC	Standing Consultative Commission
SCG	Special Consultative Group
SDI	Strategic Defense Initiative
SLCM	Sea-Launched Cruise Missile
SLBM	Sea-Launched Ballistic Missile
SNEC	Subgroup on Nuclear Export Coordination
SRINF	Shorter-Range Intermediate-Range Nuclear Forces
START	Strategic Arms Reduction Talks
TRANSEAVER	Transport by Sea Verification
TTBT	Threshold Test Ban Treaty
UNDC	United Nations Disarmament Commission
UNGA	United Nations General Assembly

1 - PERSPECTIVES

During the past seven years, the United States, through its arms control policies, has sought to make America, its allies, and the world more secure. By insisting on genuine constraints and arms reductions, rather than cosmetic appearances that characterized some earlier arms control efforts, we have sought to put arms control in its proper role -- one of enhancing security and solving problems, rather than institutionalizing them. We have learned that progress can be made toward arms control agreements in our mutual interests, but only if we show firmness and patience. Moreover, we have learned that if arms control is to be meaningful -- if it is truly to contribute to national security and to global and regional stability -- all parties must fully live up to the obligations they undertake.

In adhering to these precepts, the Reagan Administration's efforts on arms control have begun to bear fruit. When President Reagan first proposed in November 1981 a "zero" option for intermediate-range nuclear missiles and deep reductions in strategic offensive nuclear arms, the conventional wisdom held that the Soviets would never agree. His proposals were dismissed by some as inherently not negotiable. However, events over the past two years in Washington and at Reykjavik have disproved this conventional wisdom. By negotiating from a position of strength, and resisting proposals which would have codified arms increases, the President has redefined what is "negotiable." Now, for the first time, the United States and the Soviet Union are negotiating nuclear arms control agreements which, if achieved and complied with fully, will effect real and deep reductions in offensive nuclear arsenals, particularly in the most destabilizing systems.

The December 8 signing of the Intermediate-Range Nuclear Forces (INF) Treaty at the Washington Summit was a major achievement in arms control. This agreement, when ratified and put into force, will accomplish what the

Administration set out to do, namely, eliminate an entire category of US and Soviet nuclear arms, a category in which the Soviets have deployed several times more weapons than we have.

Our talks with the Soviet Union on strategic arms reduction, or START, also have shown some progress. We have an agreement in principle with the Soviets for 50 percent reductions in US and Soviet strategic offensive nuclear weapons -- a result of talks between President Reagan and General Secretary Gorbachev in Washington and at Reykjavik. Our negotiators have been working hard to build on this consensus. If the Soviets are serious about negotiating, a START agreement could emerge in 1988.

Our objective at the bilateral US-USSR Nuclear and Space Talks (NST) in Geneva has been to reach agreements on offensive nuclear weapons that: (1) increase stability and reduce the likelihood of war; (2) codify deep reductions from current force levels; (3) leave each side with equivalent levels of forces; and (4) are effectively verifiable. Such agreements would be contingent upon resolution of outstanding issues concerning START and the Antiballistic Missile Treaty (ABM).

In the area of strategic defenses, the United States is seeking to discuss with the USSR (should effective defenses prove feasible) whether the two countries could jointly manage a stable transition to a deterrence based increasingly on defense, rather than on the threat of retaliation by offensive nuclear weapons. However, Soviet insistence that the ABM Treaty be interpreted in such a way as to cripple our Strategic Defense Initiative (SDI), even while the Soviets work on their own SDI program, is a major obstacle.

If the Soviets are unwilling to permit us to reduce our vulnerability through a mutual deployment of strategic defenses, there is little basis for believing they would permit a genuine reduction in our vulnerability through some other arms control arrangement. There is no better way to achieve greater security for both sides than strategic defense deployments, in combination with deep reductions in offensive arms.

The notion that strategic defenses and arms control are somehow contradictory becomes increasingly implausible with the development of effective defenses. Quite the contrary, defensive systems may be just the ingredient necessary to bring about radical reductions in offensive arsenals. Effective defenses deployed by each country would make offensive weapons considerably less useful. Both sides would be faced with a fundamental question: which contributes more to their security -- a better offense or a better defense? More effective defensive technologies will create a strong incentive to shift resources into defensive systems, since that is where security will lie. Then the cause of arms control -- of genuine stability -- will be well served.

Despite progress during the last year in arms control, several serious and difficult issues remain. For the security of our nation, arms control verification and compliance are of the utmost importance. If we are to achieve real reductions, we must have confidence in the results of negotiated agreements. Confidence is essential -- for without it, faith in agreements, and hence stability, erodes. Such confidence is not possible without effective verification and compliance measures.

Previous instances of Soviet noncompliance with arms control agreements continue to be a matter of concern. They could call into question the potential security benefits of arms control and create new security risks. They also could undermine the confidence essential to an effective arms control process in the future. Six annual Presidential reports on Soviet noncompliance with arms control agreements have been forwarded to Congress. The United States is determined to do its part to resolve the compliance issue, but much depends on the attitude and willingness of the Soviet Union to comply with its treaty obligations.

One must bear in mind, of course, that progress in arms control in and of itself does not signify any fundamental improvement in the US-Soviet relationship. We have heard many claims on how arms control can remedy our security, lead to a new era of East-West relations, and solve the main problems between democracies and totalitarian governments. Such claims

are incorrect. Arms control alone cannot solve the problems that have perpetuated the East-West division. Arms control deals only with the symptoms of US-Soviet discord — not the causes. What counts in arms control and the US-Soviet relationship is the broad picture. And the broad trend since 1981 has been toward greater stability in US-Soviet relations, because of renewed US strength and self-confidence. Our central task is to preserve this trend, with or without new arms control agreements.

The future outlook for arms control has elements for caution, but also for hope. Caution, because arms control can be cleverly used by a more vigorous and alert Soviet leadership to dull our senses to the repressive nature of the Soviet system. Hope, because, with sobriety, we can be rational about the Soviet Union and the possibilities for improved US-Soviet relations. With such a realistic attitude, we can continue to seek progress in arms control.

It is somewhat ironic that while US steadfastness on basic principles and consistent willingness to negotiate meaningful and verifiable agreements with the Soviet Union finally have resulted in a more forthcoming attitude by the Soviets, our policy has received little credit for its accomplishments. The record shows that reducing INF missiles to zero was President Reagan's idea, based on a NATO decision. It was adopted by the Soviet Union only after years of continuous American prodding. The central principle of deep reductions in strategic offensive forces also was accepted by the Soviets only at American insistence, and after we had resisted countless Soviet efforts to force US acceptance of cosmetic freezes, rather than real reduction levels.

However, we cannot force the pace of negotiations. Soviet tactics of delaying and backtracking on their positions continue to underscore the need for patience. The key to success lies in our ability to bargain fairly and consistently, and to insist that arms control squarely addresses our security concerns, as well as those of our allies. We must

continue with the approach that has brought us this far in arms control. It is the only approach that has worked.

The President has lived up to his promise to the American people -- that we would make no arms control agreement that did not meet our security requirements, nor would we sign anything that allows the arms race to continue. In standing firm, this country has achieved a long desired agreement with the Soviet Union -- in many respects a better kind of arms control treaty than we ever have achieved before. As we set about the ratification process for the INF treaty, and with prospects for movement in other arms control areas as well, there are grounds for cautious optimism.

Arms negotiations with the Soviet Union have never been easy. However, over the past seven years the United States has laid a solid foundation for a new arms control structure, based on deep and stabilizing reductions and the possibility of reliance on defensive technologies. In the INF agreement we have seen the first fruit of this new approach. To finish the task will require perseverance in following the principles that have taken us this far. It is a course that must be followed for the security of the United States and for all peace-loving nations of the world.

2 - BILATERAL ARMS CONTROL

Arms control negotiations between the United States and the Soviet Union during the year eclipsed all previous years in volume and intensity. In addition to the three Nuclear and Space Talks negotiations (INF, START, and Defense and Space) bilateral negotiations were also held on the establishment of Nuclear Risk Reduction Centers, Nuclear Testing, and Chemical Weapons. This section contains details on all of the bilateral negotiations with the exception of Chemical Weapons, which are found in the Multilateral Arms Control section.

Intermediate-Range Nuclear Forces

After six years of effort, the INF negotiations reached a successful conclusion on December 8. President Reagan and General Secretary Gorbachev signed a treaty that would eliminate the entire class of US and Soviet ground-launched INF missiles.

In retrospect, the Reykjavik, Iceland, summit outcome of October 1986 can be seen as a key turning point, setting the stage for negotiations through the rest of 1986 and well into 1987. A second major milestone occurred in July 1987 when the Soviet Union agreed to global elimination of all INF missiles. Hence 1987 should be seen in two phases. The first phase involved the continued effort of the United States to build on the common ground reached at Reykjavik, which was incorporated in a draft treaty tabled by the US delegation in the late winter. The second phase consisted of rapidly paced negotiations after July 23, 1987, when the Soviet Union finally agreed to the global elimination of INF missiles, ranging from 500 to 5,500 kilometers. This Soviet acceptance of a long-standing, preferred US position settled the scope and essential terms of an INF agreement based on equal global limits and elimination of the whole class of US and Soviet INF missiles. It cleared the way for both sides to move forward on the methods of elimination and phasing of reductions, and simplified the procedures that would be necessary for an effective verification regime.

During the seventh round of negotiations in the INF group, which began in January and ended in March, the United States continued to seek to clarify and build upon the common ground reached at Reykjavik. The outcome at Reykjavik was an agreement in principle on an equal global limit of 100 warheads on Longer-Range Intermediate-Range Nuclear Force (LRINF) missiles (1,000 to 5,500 kilometers), with none in Europe, and with the remaining LRINF to be deployed in Soviet Asia and on US territory.

The Soviet Union at Reykjavik had dropped its long-running insistence on the inclusion of British and French forces and had agreed in principle to constrain Shorter-Range Intermediate-Range (SRINF) missile systems (500

to 1,000 kilometers) as an integral part of an INF agreement. The Soviet side had also agreed at Reykjavik on US-proposed key principles of an effective verification regime. But, during late 1986 and early 1987, the Soviet side held further progress on INF hostage to a "package" agreement in an effort to relink INF to strategic arms reductions and to US concessions on defense and space issues, particularly the Strategic Defense Initiative (SDI). This linkage obstacle was removed by General Secretary Gorbachev's announcement on February 28 that the Soviet Union was prepared to conclude a separate agreement on INF. The door to the negotiation of the provisions of a treaty text based on the Reykjavik formula was now essentially open. However, there remained wide differences on SRINF, verification, and several other specific issues (e.g., the timing of Soviet reductions of SS-20s in Asia).

At the beginning of 1987, the sides were still far apart on SRINF. Recognizing that SRINF missiles could be used by the Soviet Union to circumvent an agreement limiting only LRINF missiles, the United States had insisted from the outset that an INF agreement constrain SRINF missiles. The Soviet Union had reaffirmed at Reykjavik that constraints on SRINF should be integral to an initial INF agreement, but resisted the US demand for global coverage at equal levels. It argued instead for a freeze on current missile systems under 1000 kilometer range to be applied to Europe only (which would have left the Soviet Union a de facto monopoly of SRINF missiles). The Soviets were also vague about what specific Soviet missile systems would be covered under SRINF limits. Moreover, Gorbachev's February 28 announcement actually sought to separate negotiations on SRINF missiles from an initial INF agreement, reversing the previous Soviet position reaffirmed at Reykjavik that constraints on SRINF would be integral to an INF agreement.

On March 4, after consultations with the Allies, the United States tabled a draft INF treaty that incorporated the INF measures agreed at Reykjavik. Its essential provisions were:

o phased reduction by 1991 to a global ceiling of 100 LRINF warheads

by each side to be deployed in Soviet Asia and on US territory respectively;

- o global constraints limiting US and Soviet SRINF missile systems, within the range band of the Soviet SS-12 (SCALEBOARD) and SS-23 missiles, to the current Soviet level; and
- o strict provisions for a detailed, comprehensive and effective verification regime.

When the US draft treaty was tabled, several important unresolved issues existed. While agreeing to the core limit of 100 INF missile warheads, the Soviet side resisted any geographical restrictions on the deployments of their missiles in Asia. While agreeing to five years as the period for phasing reductions of LRINF in Europe to zero, the Soviet side resisted until late March an agreement to make reductions in Asia parallel to the European reductions. The Soviet side also insisted that each side's remaining LRINF be "beyond striking range" of the other's territory, in an effort to deny the United States the option of deploying its remaining LRINF in Alaska.

The United States separately tabled the basic elements of the US approach to verification on March 12, including:

- o provisions for the use of and noninterference with "national technical means" (NTM) of verification, a requirement for the broadcast of engineering measurements on missile flights, a ban on encryption of telemetry and a ban on concealment measures that impede verification;
- o specification of areas and facilities where treaty-limited systems must be located, and prohibition against having them elsewhere;
- o reciprocal exchange of a specified, comprehensive set of data related to treaty-limited systems and their support facilities and equipment;
- o reciprocal updates of this data during reductions;
- o procedures for destruction, dismantlement and conversion of LRINF systems, including on-site inspection; and

- o provisions for on-site inspection (OSI) and perimeter/portal monitoring of specific facilities.

The Soviet side, however, was unwilling to go beyond the general statements on verification agreed at Reykjavik to discuss the measures and procedures in depth.

After the conclusion of Round VII, Secretary of State Shultz and Foreign Minister Shevardnadze met in Moscow on April 13-15; concurrent technical Expert Group meetings also were held. The sides agreed that the INF reductions should be accomplished in no more than four to five years. The Soviet side clarified its position on SRINF somewhat, offering to withdraw its forward-deployed SRINF missiles in Eastern Europe and advocating a separate SRINF negotiation after an initial INF treaty, suggesting the outcome be elimination of US and Soviet SRINF within a year. In response, the United States reaffirmed its position that any solution to the SRINF problem had to be an integral part of an INF treaty and could not be deferred.

The United States reiterated its strong preference for zero LRINF globally, and pointed out that this would simplify verification. Following the Moscow ministerial, the United States began consultations with the Allies about whether to propose elimination of all SRINF systems or to continue to insist on equal finite levels.

Round VIII began on April 23 and ended with the completion of the Treaty in December. Before the round began President Reagan called on the Soviet Union to speed progress in the INF negotiations by responding to the US verification proposals. The Soviet delegation tabled its draft INF treaty on April 27 in two parts, a basic treaty text and an annex consisting of agreed statements and common understandings.

The Soviet draft treaty included many of the points of the earlier US draft, but left a number of points unresolved and opened up a new obstacle related to the West German Pershing IA missile force. The Soviet draft:

- o reflected the Reykjavik formula on LRINF, with the residual missiles with the capability of carrying 100 warheads deployed

outside Europe, and prohibited stationing within range of the other's territory;

- o proposed LRINF reductions in two phases, 50 per cent in the first, three-year phase, and reduction to zero in the second, two-year phase;
- o omitted SRINF from the treaty text, mentioning it only in a separate prepared statement. This statement on SRINF, however, called for equal global limits, with zero in Europe for both sides. It included as SRINF-limited systems the Soviet SS-12 and SS-23; and
- o proposed, in a major shift, the inclusion of US-owned warheads for the West German Pershing IA in an INF agreement, a position the United States immediately rejected as incompatible with a bilateral US-Soviet agreement and with the existing US-FRG program of cooperation.

The United States continued to stress that agreement on zero LRINF globally would facilitate negotiations on verification, and proposed reductions in three one-year phases over a three-year period, with LRINF warhead equality to be achieved at the end of the first stage. The US side made clear that the belated Soviet effort to bring West German Pershing 1A missiles into the agreement was unacceptable.

In June, the US and Soviet delegations agreed on an initial joint draft treaty text that paralleled the US draft of March 4. While this was heavily bracketed to note differences, it was a useful baseline for resolving the remaining issues. At the same time, the Soviet delegation adopted a more practical approach, enabling the sides to step up the pace of negotiations.

Soviet reluctance to address the specifics of verification persisted until mid-June. The US side had tabled several verification articles in the draft treaty: the draft texts of a Memorandum of Understanding on Data on May 7, a Protocol on Destruction or Dismantlement and Conversion on May 14, and an Inspection Protocol in September. Until June 16, when

the Soviets tabled a draft Protocol on Dismantlement or Destruction, they had presented only a single article containing the basic elements of their verification approach. This contrasted with their public statements which erroneously implied that the Soviet Union's approach to verification was more demanding and intrusive than that of the United States. Subsequently on July 2, the Soviet side finally tabled a proposed article on OSI.

Following Allied consultations on SRINF, President Reagan announced on June 15 that the United States would support the elimination of US and Soviet SRINF systems, provided that the elimination was global, bilateral, effectively verifiable, and an integral part of an INF agreement that included the Soviet SS-12 and SS-23 missile systems. The NATO Foreign Ministers at Reykjavik on June 12 had expressed allied support for the global and effectively verifiable elimination of all US and Soviet land-based SRINF missile systems as an integral part of an INF agreement, and called on the Soviet Union to accept elimination of all land-based LRINF missile systems, in accordance with NATO's long-standing objective.

A major breakthrough in the Soviet movement toward the US preferred position on INF occurred July 22 when General Secretary Gorbachev announced that the Soviet Union was prepared to eliminate all US and Soviet land-based INF missiles. Both LRINF and SRINF were to be included, a solution, in shorthand, called "global double zero." This meant that the Soviets had agreed to accept the basic approach originally proposed by President Reagan in April 1981 and the US long-held position that SRINF should be constrained under equal global limits in an initial INF agreement.

The modified Soviet position, however, contained certain troublesome conditions related to the methods of elimination, the inclusion of US warheads on West German missiles as INF systems, and less stringent verification provisions than those proposed by the United States.

President Reagan announced on July 27 the tabling of a new proposal for implementing a global double zero outcome, including:

- o global elimination of US and Soviet ground-based, longer-range INF missiles;
- o global elimination of US and Soviet shorter-range INF missiles;
- o destruction of missiles and launchers which are to be eliminated;
- o no conversion of INF missiles and launchers to other types of weapons systems;
- o no transfer of existing US and Soviet INF missiles and launchers to any third party; and
- o strict and effective verification provisions, simplified by the Soviet acceptance of global double zero.

On August 26, the US delegation in Geneva tabled a revised verification approach taking into account the US-Soviet agreement on global double zero. The United States tabled on September 22 a draft treaty and revised verification proposal based on global double zero. The United States reiterated that the Pershing IA missiles were part of an established pattern of cooperation with West Germany, and under a long-standing principle were not subject to the bilateral INF negotiations between the United States and Soviet Union.

Even with some elements simplified, the US verification proposal in this draft treaty called for the most stringent verification regime in arms control history. Its key elements include:

- o the requirement that all INF missiles and launchers be geographically fixed in agreed areas or in announced transit between such areas during the reductions period;
- o detailed exchanges of data, updated as necessary, on the location of missile support facilities and missile operating bases, the numbers of missiles and launchers at those facilities and bases and technical parameters of those mobile systems;
- o a baseline OSI to verify the numbers of missiles and launchers at declared missile support facilities and missile operating bases prior to elimination;

- o OSI to verify the elimination of missiles and launchers;
- o a requirement for a separate "close-out" inspection to ensure that when a site is deactivated and removed from the list of declared facilities, it has indeed ended INF-associated activity;
- o follow-on, short-notice inspection of declared facilities during the reductions period to verify residual levels until all missiles are eliminated; and
- o short-notice, mandatory challenge inspection of certain facilities in the United States and USSR, at which banned missile activity could be carried out.

At the meeting between Secretary of State Shultz and Foreign Minister Shevardnadze in Washington on September 15-17, the United States and the Soviet Union agreed in principle to conclude an INF treaty on ground-launched intermediate-range nuclear forces, which would eliminate the entire class of US and Soviet INF missiles, and agreed that the treaty should be ready for signing in the fall of 1987. Both sides instructed their delegations to work intensively to resolve the remaining differences on the draft treaty text and related documents, the details of verification procedures, and the time frame for reductions.

The September Shultz-Shevardnadze meeting also produced agreement on procedures for the elimination of INF missile front sections. Specifically, the sides agreed that before US and Soviet INF missiles are eliminated, the nuclear devices and guidance systems will be removed from the missile front sections and returned to national authorities. The remaining structure will then be destroyed under agreed procedures.

In view of Chancellor Kohl's August 26 statement of intent to dismantle and eliminate the Federal Republic of Germany's Pershing IA force once US and Soviet INF systems have been destroyed, the US and Soviet sides also reached agreement that after US reentry vehicles associated with West German missiles have been released from the program of cooperation, they would be withdrawn to US territory and eliminated by the same procedures as for front sections of the other missile systems.

The United States made it clear that this US-Soviet bilateral agreement concerning warheads released from programs of cooperation does not apply to third country forces and will not affect existing US programs of cooperation with allies.

Further progress was made on phasing of reductions and verification provisions in Moscow during the October 22-23 meeting between Secretary of State Shultz and the Soviet side, led by General Secretary Gorbachev and Foreign Minister Shevardnadze. But the expected goal of that meeting to set a date for an agreed US-Soviet summit to be held in the United States before the end of 1987 failed to materialize. Gorbachev indicated that he was not sure he was ready for a summit unless the subjects of defense and space and the ABM Treaty were included. The Soviet side almost immediately reconsidered, however, sending Foreign Minister Shevardnadze on short notice to Washington for additional consultation on October 30, when it was agreed to hold a summit in the United States beginning on December 7, at which time the INF Treaty would be ready for signature.

Following Foreign Minister Shevardnadze's visit to Washington, US Ambassador Kampelman met with Soviet Ambassador Vorontsov in Geneva November 15-16 to discuss outstanding INF issues. A Joint Working Text of the Treaty and its Protocols and Memorandum of Understanding that indicated areas of agreement between the sides emerged in the negotiations on November 17. The unresolved issues that remained involved verification, in particular.

Additional meetings were held between Secretary Shultz and Foreign Minister Shevardnadze in Geneva November 23-24 to attempt to resolve outstanding issues. As a result of these meetings, the sides agreed on some key verification provisions. The United States would have the right to establish inspectors and equipment to monitor for up to 13 years the portals and perimeter of the Soviet facility at Votkinsk where SS-25 and treaty-banned SS-20 missiles have been assembled. Although the United States has no comparable facility the United States agreed that the Soviet Union would have reciprocal inspection rights at a former US missile-

production facility. Each side would also have the right to conduct short-notice on-site inspections of declared and formerly declared INF facilities, with up to 20 such inspections per year for the first three years after the Treaty entered into force, 15 per year for the following five years, and ten per year for the last five years. Other details of the elaborate inspection regime were also worked out during the ministerial meeting. The United States was still awaiting Soviet submission of necessary data, however.

In addition to the work on the Treaty with the Soviet Union, the United States conducted consultations with its Allies that are INF-basing countries to work out arrangements with them regarding Soviet inspections that would take place at US facilities on their territory.

The delegations in Geneva continued their work and were able to finalize the language of provisions in the Treaty including its Protocols and Memorandum of Understanding just prior to the Washington Summit. The Treaty documents were signed in Washington by President Reagan and General Secretary Gorbachev on December 8, 1987.

INF Treaty Highlights

The INF Treaty (See Appendix VIII) obligates the United States and the Soviet Union to eliminate all of their ground-launched ballistic and cruise missile systems having a range capability between 500 and 5,500 kilometers (between roughly 300 and 3,400 miles), and gives both sides the right to carry out verification measures to monitor compliance with the Treaty.

The INF Treaty consists of the following four principal documents setting forth its basic obligations and the means of implementing those obligations:

- The Treaty Articles obligate the United States and the Soviet Union to eliminate all their intermediate-range and shorter-range missile systems within three years and bans them thereafter, and to accept provisions to facilitate effective verification of the terms of the Treaty;

- o The Memorandum of Understanding (MOU) on Data incorporates the data as of November 1, 1987, exchanged between the Parties prior to signature regarding the locations, numbers and characteristics of each side's intermediate-range and shorter-range missile systems;
- o The Inspection Protocol sets forth the procedures for conducting agreed on-site inspections, including short-notice inspections and continuous portal monitoring;
- o The Elimination Protocol describes the detailed procedures for eliminating missiles, launchers, support facilities, support structures and support equipment covered by the Treaty.

The Treaty provides that the Parties must eliminate all of their intermediate-range and shorter-range missile systems, and prohibits the Parties from producing them thereafter. It also requires that missile-related facilities be eliminated. The intermediate-range missile systems have to be eliminated in two phases over three years; the shorter-range missile systems must be eliminated within a single 18 month period.

The intermediate-range missile systems named by the Treaty are the US Pershing II and Ground-Launched Cruise Missile (GLCM) and the Soviet SS-20, SS-4, and SS-5. The shorter-range missile systems named are the US Pershing IA and the Soviet SS-12 and SS-23. The MOU on data breaks these missiles down into two categories: deployed and nondeployed. Each side has provided data as of November 1, 1987, on the numbers, locations, and technical characteristics of their INF missile systems. When the data in the MOU have been updated after the Treaty enters into force, they will be verified by inspection.

In addition to the specifically listed US and Soviet INF missile systems that have to be eliminated, the Treaty also defines this class of systems more generally by range and obligates each side not to produce or possess such systems for the duration of the Treaty, which is indefinite.

After the INF Treaty enters into force, neither side may produce or flight-test any intermediate-range, or shorter-range missiles, or produce

their launchers. However, while the sides are prohibited from conducting any launches of shorter-range INF missiles whatsoever, they may launch up to 100 intermediate-range INF missiles within the first six months of the Treaty for the sole purpose of destroying them. Such launches for destruction purposes cannot be conducted in a manner that could produce useful information for missile development, and these launches are subject to on-site inspection.

The Treaty provides both Parties the right to establish a system of resident inspectors to continuously monitor a missile facility on each other's territory. In the case of the United States, we will have the right to such an inspection of a Soviet SS-20 and SS-25 facility at Votkinsk, while the Soviets will have the right to such inspection of a US Pershing missile facility at Magna, Utah.

In order to facilitate verification, the Treaty establishes a number of obligations restricting INF activities during the three-year reductions period. For example:

- o Intermediate-range missiles and their launchers can only be located in their designated deployment areas or support facilities, such as storage, repair, or elimination facilities, or in specified transit between them. Permitted locations are all named and defined by geographic location and size in the data exchange.
- o Within 90 days after the Treaty enters into force, all deployed shorter-range missiles and all deployed and undeployed launchers must be moved to elimination facilities. The remaining nondeployed shorter-range missiles must be removed to elimination facilities within one year.
- o Transit of INF missiles between their permitted locations must be completed within a limited period of time.

The Treaty further requires that the United States and Soviet Union provide notifications of activities related to the Treaty. These include:

- o the origin and destination of missiles and launchers in transit, with information on their location provided for specified intervals;

- o the dates for the elimination of deployment areas, bases, and support facilities;
- o the date, place, number, and type of missiles and launchers to be destroyed at specified elimination sites;
- o the date, place, and type of missiles to be destroyed through launch.

After the Treaty enters into force, data will be updated, and then notification of changes to that data at prescribed intervals will be required thereafter.

All of these notifications, as well as those related to data updates and inspections are to be communicated via the Nuclear Risk Reduction Centers.

The Treaty and the Elimination Protocol contain the general guidelines and specific procedures for the elimination of missiles, launchers, support structures and support equipment. These include:

- o Missile systems are to be reduced in complete organizational units to simplify the verification task;
- o Destruction is to be carried out at mutually agreed facilities, and only at those facilities;
- o A maximum of a 100 intermediate-range missiles can be eliminated by launch in accordance with the provisions discussed above; and
- o Key support structures are to be eliminated where they stand.

While the United States will continue to use its NTM as the principal method of monitoring the Treaty, another important means to assist in verification is through the unprecedented on-site inspection rights established by the Treaty. There are several types of inspections:

- o Baseline Inspections - to help in verifying the initial exchange of updated data, there is a right to conduct OSI of agreed locations listed in the MOU within three months after the Treaty enters into force. This includes facilities and bases located in the German Democratic Republic and Czechoslovakia, where the Soviet Union has

deployed shorter-range missile systems, in addition to locations in the Soviet Union.

- o Close-out Inspections - when bases or missile support facilities are eliminated, the United States will have the right to conduct inspections to observe that Treaty-prohibited activities have ceased. We can inspect all such locations for a close-out inspection if we so choose.
- o Elimination Inspections - the United States has the right to observe the destruction of missiles and launchers at the elimination sites. The procedures for destroying them are set forth in the Elimination Protocol, and the inspections will allow the United States to observe that these procedures are being carried out. This right to observe elimination of missiles and launchers is not restricted by any quota.
- o Short-notice Inspections - for thirteen years after the Treaty enters into force, the United States and the Soviet Union are entitled to conduct a specific number of short-notice inspections per year of agreed locations. Thus, during the first three years of the Treaty, i.e., before all systems have been eliminated, the United States has the right to 20 short-notice inspections per year at both currently active bases and facilities, as well as those that will have been eliminated. For the first five years after the complete elimination of INF missile systems, the United States can conduct 15 on-site inspections each year. For the next five years, the United States can conduct ten similar inspections each year.
- o Portal Monitoring of Production - For the special case of the Soviet SS-25 ICBM, which is assembled at a facility where SS-20 missiles formerly were assembled, the Soviet Union has explicitly agreed to allow the United States to establish a continuous monitoring system at the SS-25 final assembly facility at Votkinsk near the Ural Mountains, or any other facility that may in the future conduct final assembly of the SS-25.

Detailed procedures for the conduct of all of the inspections listed above are contained in the Inspection Protocol.

For the purpose of ensuring verification of compliance with the provisions of the Treaty by established procedures the following agreements became a part of the Treaty:

- o National Technical Means - in addition to allowing on-site inspections to verify compliance with the INF Treaty, the Parties have undertaken not to interfere with each other's NTM, and to take specific steps to enhance the other side's ability to monitor by NTM.
- o Special Verification Commission - The United States and the Soviet Union have also agreed to establish a Special Verification Commission, which can be convened at the request of either side to resolve problems relating to compliance with the Treaty.

All of the Treaty documents, including the MOU on Data, the Inspection Protocol, and the Elimination Protocol are subject to ratification.

The INF Treaty is of unlimited duration. A Party may withdraw from the Treaty if it decides that extraordinary events related to the subject matter of the Treaty have jeopardized its supreme interests.

The Strategic Arms Reduction Talks

The outlines of a START Treaty became evident to both the United States and the Soviet Union as a result of the progress made at Reykjavik in October 1986, thus setting the stage for negotiation of a draft Treaty text in 1987. With this objective in mind, the United States approached Round VII in January 1987 with the view of further narrowing the differences that remained between US and Soviet START proposals.

In the Fall of 1986, after Reykjavik, US negotiators in Geneva had already tabled new proposals reflecting the progress made in Iceland, as well as an offer to accept higher sublimits on the different categories of ballistic missile warheads in a compromise effort to meet Soviet concerns, while still meeting the goal of ensuring strategic stability. Thus, the

US delegation returned to Geneva in January with the expectation that the Soviet side would take steps to move the negotiation forward.

However, Soviet substantive positions during Round VII remained unchanged from the previous round and the Soviet side backtracked on other issues by withdrawing proposals made prior to Reykjavik, such as warhead sublimits. For example, the Soviet Union had earlier made proposals for sublimits of 80-85 percent for warheads on ballistic missiles and 60 percent for warheads on intercontinental ballistic missiles (ICBMs). The Soviet side now argued that these proposals had been superceded by their Reykjavik proposal. The Soviet proposal for a 50 percent cut in Soviet heavy ICBMS, albeit a positive move, could not substitute for the three sublimits proposed by the United States; that is, effective and stabilizing sublimits on the total number of warheads permitted on ballistic missiles, the total number of warheads permitted on ICBMs, and the total number of warheads that can be concentrated on multiple independently-targeted reentry vehicle (MIRVed) ICBMs that carry more than six reentry vehicles.

Despite the lack of substantive movement during Round VII, progress was made in clarifying differences when the sides agreed to develop a joint working document which specified the points of agreement and disagreement on key issues. This joint working document was drafted in a new, joint US-Soviet working group which took directions from, and reported to, the sides' respective head negotiators. In a constructive fashion, the working group adopted a more flexible and informal negotiating format as previously suggested by US negotiators during informal talks with Soviet negotiators in December 1986 at Geneva.

Agreement on the joint working document at the end of Round VII in March was useful in preparing Secretary Shultz and accompanying US experts for their meetings with General Secretary Gorbachev and Foreign Minister Shevardnadze April 13-15 in Moscow, as well as in completing the development of a US draft START Treaty text in Washington between Rounds VII and VIII.

Relatively less progress was made on START than INF during the April Moscow meetings. For its part, the United States sought to demonstrate flexibility on a START issue of central concern -- effective warhead sublimits. Taking into account expressed Soviet concern about the substantial force restructuring impact of the US-proposed sublimits, the United States proposed in Moscow that the 50 percent cuts be implemented over seven years instead of five, thus giving the Soviet side time to make necessary adjustments to meet the sublimits. The Soviet side reacted negatively to this US offer, and instead argued that the price of their agreement at Reykjavik to a bomber weapon counting rule was the dropping of any ballistic missile warhead sublimits. This Soviet contention was completely incorrect and unjustified. The fact of the matter was rather that US acceptance of the bomber weapon counting rule at Reykjavik was based on the assumption that there would be warhead sublimits.

One useful result of the Moscow meetings was the sides' agreement to put aside, for the moment, the longer-term question of reductions greater than 50 percent, and rather to focus on achieving agreement on 50 percent reductions -- a considerable achievement in itself. Finally, the United States proposed in Moscow that the two sides begin drafting treaty language during Round VIII and that they seek to conclude a START Treaty by the end of 1987 or early 1988.

President Reagan expressed his determination in a public statement on May 4, 1987: "We have made great progress in START. I am firmly convinced that a START agreement is within our grasp, even this year, if the Soviets are prepared to resolve the remaining outstanding issues. And most important among these issues is the need, for the purpose of ensuring strategic stability, to place sublimits on ballistic missile warheads."

Ambassador Ronald Lehman, head of the US START Negotiating Group, reiterated in a press conference on May 8 the requirement for sublimits and their historic precedents in strategic arms agreements: "They are the classic nested sublimits, as they are known; they applied that way in SALT

II, as you may remember, to delivery vehicles. That is to say, that there is a number of 6,000, of which no more than 4,800 can be on ballistic missiles, of which no more than 3,300 can be on ICBMs, of which no more than 1,650 can be on these dangerous ICBMs. So that is how the process works. It is similar to the process in SALT II and not unlike the process that was agreed in SALT I."

The United States sought to move START toward agreement by tabling a draft START Treaty in Geneva on May 8 at the beginning of Round VIII. The draft Treaty reflected the basic areas of agreement on strategic arms reductions reached by President Reagan and General Secretary Gorbachev at Reykjavik and provided for roughly 50 percent reductions in US and Soviet strategic offensive nuclear arms. Introduction of the US draft text, as the basis for a fair and durable treaty, was intended to move toward concrete negotiations and resolution of the remaining unsettled issues.

The US draft START Treaty:

- o called for a roughly 50 percent reduction to equal levels in strategic offensive arms, carried out in a phased manner over seven years from the date the Treaty enters into force;
- o specified a 1,600 ceiling on the number of strategic nuclear delivery vehicles (SNDVs) and a ceiling of 6,000 warheads on those delivery vehicles;
- o sought to ensure strategic stability and place effective limits on the most dangerous missile systems by proposing within the 6,000 warhead limit, a sublimit of 4,800 ballistic missile warheads, of which no more than 3,300 can be on ICBMs, of which no more than 1,650 can be on permitted ICBMs other than silo-based light or medium ICBMs with six or fewer warheads;
- o sought limits to codify and sustain a 50 percent reduction in current Soviet throw-weight level;
- o banned mobile ICBMs because of serious verification and stability problems and their inherent suitability for reloading and refire;

- o counted each heavy bomber as one SNDV and each heavy bomber equipped for gravity bombs and short-range attack missiles (SRAMs) as one warhead in the 6,000 limit; and,
- o included a comprehensive verification regime providing for an exchange of data both before and after arms reductions take place, on-site inspection to verify the data exchange and to observe the elimination of weapons, an effective on-site monitoring arrangement for facilities and remaining forces following the elimination of weapons, and a commitment not to interfere with the measures of verification.

The United States, while explaining the specifics of its own Treaty provisions and responding to Soviet questions about it, also urged the Soviet Union to promptly propose a Soviet draft START Treaty text in order to expedite the negotiation. After several months, on July 31, the Soviet side tabled a detailed draft Treaty, a welcome departure from the previous Soviet practice in START of proposing only highly generalized documents containing basic principles. The Soviet draft was similar in structure to the US draft text and contained some common language which would facilitate preparation of a Joint Draft Treaty (JDT) text. However, the Soviet draft offered no movement on the major outstanding issues, including sublimits on the most dangerous missile systems, and continued to link strategic offensive arms reductions to restrictions on strategic defense that would go beyond the limitations already in the ABM Treaty -- a clear effort to cripple the US SDI.

Although the Soviet draft reflected no movement on the major outstanding issues, its presentation was a necessary step in the process of negotiating a START agreement. With both US and Soviet draft Treaties on the table, the sides continued to work intensively, during an indefinitely extended Round VIII, to explore the remaining differences and develop a JDT which would facilitate negotiation of those differences. A first agreed JDT was exchanged in Geneva October 16 by the Heads of Delegation.

Even with this significant accomplishment and the considerable progress made during the year, several obstacles to an agreement remained. In addition to Soviet refusal to accept sublimits, important differences remained between the two sides on the issue of throw-weight. The Soviets continued to reject codification in an agreement of an obligation to reduce by 50 percent the throw-weight of their ballistic missile force, which is about three times that of the United States.

In addition, the sides continued to differ on the issue of mobile ICBMs. The US proposal would ban them because of the serious verification difficulties posed by mobile missiles, particularly in a closed society such as the Soviet Union, and the potential for covert deployment and refire. The Soviet Union refused to accept the US ban on mobile ICBMs.

Finally, the Soviet Union had agreed in principle to certain important aspects of the US verification proposals, but some aspects of their position remained vague. Much hard bargaining remained to reach agreement on the specific verification provisions necessary to achieve an effectively verifiable agreement, including the joint drafting of, and agreement to, the Protocols and a Memorandum of Understanding that will include many of the details related to verification.

As negotiations continued in Geneva, Secretary of State George Shultz and Soviet Foreign Minister Shevardnadze met in Washington from September 15-17 to discuss a range of important issues. Both sides emphasized the importance of START and discussed the opportunity for a Treaty in the near term.

Some progress was made. First, the Soviet Union put back on the table and updated their earlier proposal to limit the weapons on any one leg of the Triad to 60 percent of the RV total. Applying this percent to the 6,000 warhead limit results in 3,600 reentry vehicles on any one leg of the Triad. The United States believes that such a limit should apply to ICBMs only, the most destabilizing systems, and should be slightly lower at 3,300.

The Soviet side also agreed that they could express their proposal of a 50 percent cut in heavy ICBMs in terms of warheads, that is, 1,540 warheads on 154 SS-18s. Counting warheads rather than just missiles is a more useful method of accountability. They also stated that a 50 percent reduction in throw-weight would result from their START proposal and that their throw-weight would not subsequently increase; but, the Soviet Union continued to resist codification of this commitment in a Treaty. Finally, the Soviet Foreign Minister agreed to consider the seven year reduction period that the United States prefers.

Nevertheless, the major unresolved questions, such as the need for a sublimit on ballistic missile warheads and the Soviet proposal to link START to further agreements on defense, remained after the Ministerial meeting in Washington. The Joint Statement issued at the conclusion of the meeting expressed the intention of the two sides to push forward on a START Treaty.

Secretary Shultz, accompanied by US experts, travelled to Moscow for two days of discussions on October 22 and 23. These discussions are described in the INF section. Following the meetings, the Secretary stated during a press conference at NATO Headquarters on October 24 that the ingredients for a strategic arms agreement were emerging. He stressed, however, that the verification problems connected with a strategic arms agreement would be much more difficult than those in INF. The Secretary added that the US side would continue to work for progress in START and that the United States wanted to expedite the process of looking strongly at the verification subject.

On October 23, Foreign Minister Shevardnadze also held a press conference to discuss the Moscow talks. He announced that during the General Secretary's meeting with Secretary Shultz, Mr. Gorbachev presented a new Soviet proposal in START for warhead sublimits. The sublimits provided for a level of ICBM warheads between 3,000 and 3,300, a level of submarine-launched ballistic missile (SLBM) warheads between 1,800 and 2,000, and a level of air-launched cruise missiles (ALCMs) between 800 and

900. The Soviet side contended that these numbers were very close to those which the US side had referred to more than once, and that the new Soviet proposal was a major step along the way to attaining an agreement on the crucial problem of the US-USSR talks -- a sharp reduction of strategic offensive arms. (See page 29 for US draft START position.)

On October 30, Foreign Minister Shevardnadze flew to Washington for working meetings with Secretary Shultz and to deliver a letter to the President from General Secretary Gorbachev. Discussions at meetings on START focused on two main issues -- sublimits on ballistic missile warheads and verification. The Secretary tried to clarify the sublimit proposal made by General Secretary Gorbachev in Moscow. Mr. Shultz noted that the United States could not agree to the specific limits the General Secretary had suggested but that, if these numbers indicated the force structure the Soviets desire in the context of START cuts, they should be able to accommodate that structure within the 4,800 ballistic missile warhead sublimit. The US side stressed the importance of this sublimit. The discussion ended inconclusively but with a general understanding that the issue would be taken up by experts. Finally, the US side stressed the importance of moving on START verification issues; Shevardnadze was responsive to this concern.

In the October 30 Joint Announcement following the meetings, it was agreed that during the Summit Meeting in the United States, the President and the General ~~Secretary~~ would consider thoroughly the development of instructions to delegations on a future treaty covering 50 percent reductions in US and Soviet strategic offensive arms. The Joint Announcement stated that both sides would work towards early achievement of a treaty implementing the agreement to reduce strategic offensive arms by 50 percent, which could be signed during the President's visit to Moscow in 1988.

Secretary Shultz met with Foreign Minister Shevardnadze in Geneva for two days of discussions, November 23-24. They took stock of the START

negotiations, noting that US and Soviet negotiators had considerably revised and improved a joint working text which was formally exchanged at the conclusion of Round VIII.

During the discussions, the Soviet side indicated limited flexibility on the issue of a ballistic missile warhead sublimit by reaffirming a previous Soviet proposal to limit the total number of warheads permitted on ballistic missiles to 85 percent of the 6,000 warhead aggregate. Although the resulting sublimit of 5,100 would be too high compared with the US proposal of 4,800, it was a sign of progress.

It was agreed at this meeting that the arms control emphasis at the Washington Summit would be on START and private arrangements were made to begin discussions of START even before the Summit officially opened, on the evening of December 7.

The negotiations on START during the Washington Summit resulted in some significant progress. The President and General Secretary Gorbachev noted the considerable progress which had been made toward conclusion of a Treaty implementing the principle of 50 percent reductions. They agreed to instruct their negotiators in Geneva to work toward the completion of the Treaty on the Reduction and Limitation of Strategic Offensive Arms and all integral documents at the earliest possible date, preferably in time for signature during the next meeting of the leaders of state in the first half of 1988. Recognizing that areas of agreement and disagreement are recorded in detail in the Joint Draft Treaty Text, they agreed to instruct their negotiators to accelerate resolution of issues within the Joint Draft Text including early agreement on provisions for effective verification.

The Joint US-Soviet Summit Statement of December 10, 1987, stated that the negotiators should build upon the agreements on 50 percent reductions achieved at Reykjavik as subsequently developed and now reflected in the agreed portions of the Joint Draft START Treaty Text being developed in Geneva, including agreement on ceilings of no more than 1,600 strategic

offensive delivery systems, 6,000 warheads, 1,540 warheads on 154 heavy missiles; the agreed rule of account for heavy bombers and their nuclear armament; and an agreement that as a result of the reductions the aggregate throw-weight of the Soviet Union's ICBMs and SLBMs will be reduced to a level approximately 50 percent below the existing level, and this level will not be exceeded by either side. Such an agreement will be recorded in a mutually satisfactory manner.

The Joint Statement indicated the following priority tasks that negotiators should focus on:

- o the additional steps necessary to ensure that the reductions enhance strategic stability. This will include a ceiling of 4,900 on the aggregate number of ICBM plus SLBM warheads within the 6,000 total.
- o the counting rules governing the number of long-range nuclear-armed ALCMs to be attributed to each type of heavy bomber. The delegations shall define concrete rules in this area;
- o the counting rules with respect to existing ballistic missiles. The sides proceed from the assumption that existing types of ballistic missiles are deployed with the following numbers of warheads. In the United States: Peacekeeper (MX) - 10; Minuteman III - 3, Minuteman II - 1; Trident I - 8; Trident II - 8; Poseidon - 10. In the Soviet Union: SS-17 - 4; SS-19 - 6; SS-18 - 10; SS-24 - 10; SS-25 - 1; SS-11 - 1; SS-13 - 1; SS-N-6 - 1; SS-N-8 - 1; SS-N-17 - 1; SS-N-18 - 7; SS-N-20 - 10; and SS-N-23 - 4. Procedures will be developed that enable verification of the number of warheads on deployed ballistic missiles of each specific type. In the event either side changes the number of warheads declared for a type of deployed ballistic missile, the sides shall notify each other in advance. There shall also be agreement on how to account for warheads on future types of ballistic missiles covered by the Treaty on the Reduction and Limitation of Strategic Offensive Arms.

- o a mutually acceptable solution to the question of limiting the deployment of long-range, nuclear-armed sea-launched cruise missiles (SLCMs). Such limitations will not involve counting long-range, nuclear-armed SLCMs within the 6,000 warhead and 1,600 strategic offensive delivery system limits. The sides committed themselves to establish ceilings on such missiles, and to seek mutually acceptable and effective methods of verification of such limitations, which could include the employment of national technical means, cooperative measures and OSI.
- o building upon the provisions of the Treaty on the Elimination of Intermediate Range and Shorter-range Missiles. The measures by which the provisions of the Treaty on the Reduction and Limitation of Strategic Offensive Arms can be verified will, at a minimum, include:
  - -- data exchanges, to include declarations by each side of the number and location of weapon systems limited by the treaty and of facilities supporting such systems. These facilities include those for production and final assembly, storage, testing, and deployment of systems covered by the Treaty. Such declarations will be exchanged between the sides before the Treaty is signed and updated periodically after entry into force;
  - -- baseline inspection to verify the accuracy of these declarations promptly after entry into force of the Treaty;
  - -- on-site observation of the elimination of strategic systems necessary to achieve the agreed limits;
  - -- continuous on-site monitoring of the perimeter and portals of critical production and support facilities to confirm the output of these facilities, and
  - -- Short-notice OSI of:
    - (a) declared locations during the process of reducing to agreed limits;

(b) locations where systems covered by this Treaty remain after achieving the agreed limits;

(c) locations where such systems have been located (formerly declared facilities);

(d) the right to implement, in accordance with agreed-upon procedures, short-notice inspections at locations where either side considers covert deployment, production, storage or repair of strategic offensive arms could be occurring;

(e) provisions prohibiting the use of concealment or other activities which impede verification by national technical means. Such provisions would include a ban on telemetry encryption and would allow for full access to all telemetric information broadcast during missile flight;

(f) measures designed to enhance observation of activities related to reduction and limitation of strategic offensive arms by national technical means. These would include open displays of treaty-limited items at missile bases, bomber bases, and submarine ports at locations and times chosen by the inspecting party.

Defense and Space Issues

In Defense and Space, the United States returned to the negotiations in 1987 prepared to accelerate Defense and Space Talks (DST). However, the Soviet Union continued to condition 50 percent reductions in strategic offensive nuclear arms to unacceptable curbs on the US SDI program. Despite this linkage, the US delegation sought to focus discussion on resolving the basic Defense and Space issues that separate the two sides. The United States maintained its position that constraints on SDI beyond those agreed to in the 1972 ABM Treaty were unacceptable and that future strategic defenses could improve strategic stability.

At the beginning of Round VII, the United States was ready to build upon the positive aspects and accomplishments of the Reykjavik meeting. The round began with the Soviet Union accepting a US proposal made in December 1986, to prepare a Defense andSpace Joint Working Paper (JWP) describing the areas of agreement and disagreement between the two sides. In addition, the sides agreed to a change in format to facilitate preparation of the JWP. The change involved holding plenary sessions as had been done previously, but without the long formal statements and only on an "as required basis." Both sides believed that more progress on the JWP could be made if discussions were held in small informal mini-groups. The newly established mini-groups could set their own times and agenda and meet more freqently than before. With this change instituted, the United States entered Round VII with expectations that the sides could narrow their differences and meld their proposals.

The United States had two proposals on the table at the beginning of Round VII. The first proposal had been outlined in a July 1986 letter to General Secretary Gorbachev from President Reagan and proposed that the sides agree not to deploy advanced strategic defenses for a period through 1991. Thereafter, if either side wished to deploy such defenses, it would present a plan for sharing the benefits of strategic defense and eliminating ballistic missiles. The plan would be subject to negotiation for two years. If, at the end of two years, the sides were unable to reach agreement, either side would be free to deploy defenses after giving six months' notice.

The second United States proposal was tabled by President Reagan at Reykjavik in October 1986. This proposal stated: "The sides would agree to a mutual commitment, through 1996, not to withdraw from the Anti-Ballistic Missile (ABM) Treaty for the purpose of deploying advanced strategic defenses; and during that period to observe strictly all ABM Treaty provisions while continuing research, development and testing, which are permitted by the ABM Treaty." Further, it provided that:

- o Such a commitment would be contingent upon 50 percent reductions in strategic offensive arms by the end of 1991 and the total elimination of all remaining US and Soviet offensive ballistic missiles by the end of 1996.
- o The Treaty would acknowledge that either side would be free to deploy advanced strategic defenses after 1996 if it so chose, unless the parties agreed otherwise.
- o The right to withdraw from the proposed treaty for reasons of supreme national interests or material breach of it, or the ABM Treaty would be preserved.

In contrast to the United States proposals, the Soviet Union proposed that:

- o The sides make a mutual commitment for ten years not to withdraw from the ABM Treaty for any reason while strictly observing all its provisions and the sides agree on an additional ban on testing in space of all space elements of an anti-missile defense, with the exception of research and testing conducted in laboratories.
- o After 1996, the sides would begin special talks to reach a mutually acceptable decision on how to proceed further.
- o Agreement in Defense and Space would be contingent upon resolution of START and INF issues and commencement of negotiations on a Comprehensive Test Ban (CTB).

With these proposals on the table, the sides directed their efforts at preparing a JWP. Because of the intensified efforts on the JWP, Round VII proved to be one of the most active rounds to date. However, despite accelerated meeting schedules and in-depth discussions, the major areas of agreement and disagreement in the DST remained essentially unchanged. Even though both sides' positions were based on a mutual commitment not to withdraw from the ABM Treaty for a ten-year period, there was disagreement on what the conditions of the agreement meant and what the sides were agreeing not to do during the ten-year nonwithdrawal period. The Soviets

continued their past efforts to cripple or kill the SDI program even as their own strategic defense programs continued apace.

In Moscow, both sides offered new proposals in Defense and Space and attempted to clarify the details of their new proposals. The new US proposal was designed to take into account the fact that a START agreement for 50 percent reductions seemed to be more acceptable to the Soviet Union than eliminating ballistic missiles. The United States proposed not to withdraw from the ABM Treaty through 1994. This commitment was contingent on implementation, as scheduled, of agreed START reductions, i.e., 50 percent cuts to equal levels of 1,600 delivery vehicles and 6,000 warheads, with the appropriate sublimits, over seven years from entry into force of a START agreement. This commitment did not alter the sovereign rights of the sides under customary international law to withdraw in the event of material breach or jeopardy to supreme national interests. After 1994, either side could deploy defensive systems of its choosing, unless mutually agreed otherwise.

Secondly, the United States attempted to advance the Defense and Space negotiations with a new proposal to meet the Soviet Union's concern for predictability. The United States proposed a "predictability package" containing an annual exchange of data on planned strategic defense activities, reciprocal briefings on respective strategic defense efforts, visits to associated research facilities and the establishment of procedures for reciprocal observation of strategic defense testing.

The "predictability package" was proposed to create a regime that would allow dramatic reductions in nuclear arms while ensuring that neither side faced sudden changes in the strategic environment. The US proposal was designed to enhance mutual confidence through greater awareness of the strategic defense programs of the other side and at the same time allow both sides to continue their exploration of the potential for strategic defense. In presenting its new proposal, the United States emphasized to the Soviet Union that it provided for predictability through 1994 and allowed both sides the option of deploying defenses after 1994.

The Soviet Union also presented a new Defense and Space proposal at the April Moscow Ministerial. The Soviets again called for a ten-year period of nonwithdrawal from the ABM Treaty. As under the new US proposal, this period would be keyed to initial START reductions of 50 percent. They did add a new element, proposing that we agree on a list of prohibited space-based objects which would not be put into space in the course of strategic defense research. The Soviet Union also clarified that under their proposal, research on space-based ABM devices would be permitted only at ground-based laboratories and at ABM test ranges and factories. Also, the Soviet proposal called for the sides to begin negotiations before the end of the ten-year nonwithdrawal commitment on how to further proceed after the ten years had elapsed. As before, though, the Soviet proposal did not provide for the right to deploy at the end of the nonwithdrawal period.

Overall, the April ministerial provided the forum for both sides to present their new proposals and clarify some of the details. However, the Soviet proposal was clearly intended to have the same effect as their earlier proposals -- that being to kill or cripple the US SDI program. The new proposals presented at the Moscow Ministerial established the sides' starting positions for Round VIII.

With both sides having new proposals on the table, the United States approached Round VIII with the view of further narrowing differences between the two proposals. However, in Round VIII progress was slow in comparison to previous rounds. As before, the sides used the minigroup format used in Round VII, but the Soviet side was reluctant to meet as often as it had in Round VII. Despite repeated US attempts during the Round, the Soviets would not engage constructively on either their proposal or the US proposal. After several weeks of stalling from the Soviet side, it was apparent to the United States that the Soviets were awaiting new guidance.

While the United States continued to press the Soviet Union in Geneva, the hope for a new Soviet willingness to negotiate seriously lay in the

outcome of the September 15-17, 1987, Ministerial meeting in Washington. However, the results of that Ministerial in Defense and Space were not encouraging. The Soviet Union did not change its previous position on strategic defenses and further complicated the Geneva negotiations by insisting that the United States to choose one of the two following alternatives before serious discussions could continue:

First, both sides would agree on a list of space-based devices which would not be allowed to be put into space if they exceeded certain performance parameters. Devices on the list could be put into space for any reason if they did not exceed the parameters. All other space-related ABM research would be restricted to ground-based laboratories.

Second, as an alternative to the ban on placing in space devices exceeding certain performance parameters, the Soviets proposed strict compliance with the ABM Treaty as "signed and ratified in 1972." The Soviets have not elaborated on details of this alternative but it has been clear in their past statements that the effect of Soviet proposals would impose restrictions on defense even going beyond those agreed to in the ABM Treaty. This is unacceptable to the United States. As before, these alternatives were contingent upon the US agreement not to withdraw from the ABM Treaty for ten years and did not provide for the right to deploy strategic defenses in the absence of an agreement after the ten year period.

Instead of elaborating on these alternatives during subsequent discussions in Geneva, the Soviets insisted that the United States agree to one of the two alternative Soviet proposals before they would begin to negotiate seriously. Nevertheless, the United States continued its efforts to explain and advance our proposals to the Soviet Union in Geneva, and to question and probe the Soviet Union on its Defense and Space proposals, but no progress was achieved. Instead of continuing the minigroup meetings, the Soviet Union proposed that the sides go back to the formal meetings that were held in previous rounds. These formal meetings,

although useful in the past, had not been as productive as the more recent minigroup meetings. The minigroup meetings allowed for more flexibility and deeper probing of the positions of both sides. As the Soviet Union retreated from the progress achieved in earlier rounds, they continued to request that the United States choose one of the two Soviet alternative proposals.

As the negotiations were slowing down in Geneva, the United States was preparing for another Ministerial meeting in Moscow between Secretary Shultz and Foreign Minister Shevardnadze. At the October 1987 Ministerial, both sides elaborated their positions, discussing areas of agreement and disagreement. The Soviet Union was willing to talk about what type of research could be accomplished in space, but when pressed by the United States to clarify their position further, no progress was achieved.

One week after the Moscow Ministerial (October 30), Secretary Shultz and Foreign Minister Shevardnadze met again in Washington. At this meeting, the Soviet Union expressed unwillingness to discuss SDI. Instead, they indicated that the sides should discuss these issues in terms of "strategic stability." Although the United States acknowledged that this approach could result in more constructive Defense and Space exchanges in the future, the Soviets would not engage further on their new statement. And they have made clear that this represents no substantive change in their efforts to cripple SDI. It is interesting to note that even though the Soviet Union had discussed this "new" approach in Washington, the Geneva negotiators showed no new flexibility and even regressed from earlier stated positions. With this apparent dichotomy in the Soviet position, the United States prepared for the Summit between President Reagan and General Secretary Gorbachev.

The Soviet Union came to the Washington Summit stating that they were not prepared to discuss strategic defenses. Instead, despite their violation of the ABM Treaty, the Soviet side wanted only to discuss adherence to the Treaty. Despite their presummit positioning, some

Defense and Space progress was made with the Soviets in Washington. Both sides agreed to instruct their delegations in Geneva to work out an agreement that would commit the sides to observe the ABM Treaty as signedin 1972, while conducting required research, development, and testing permitted by the ABM Treaty, and not to withdraw from the ABM treaty for a specified period of time. The sides also agreed that intensive discussions of strategic stability shall begin not later than three years before the end of the specified period, after which, if the sides have not agreed otherwise, then each side would be free to decide its course of action. The sides also agreed that the agreement they would negotiate would have the same legal status as the Treaty on Strategic Offensive Arms, the ABM Treaty, or other similar legally binding documents. In addition, the sides agreed to discuss ways to ensure predictability in the development of the US-Soviet strategic relationship under conditions of strategic stability to reduce the risk of nuclear stability.

In summary, the Washington Summit provided the required background to further clarify the sides' Defense and Space positions and establish the starting point for future Geneva negotiations.

Nuclear Risk Reduction Centers

On May 4, US and Soviet negotiators reached agreement in Geneva on a draft joint text to establish Nuclear Risk Reduction Centers (NRRCs) in their respective capitals. The agreement was signed in Washington September 15. The objective of the centers is to help reduce the risk of war between the United States and the Soviet Union that might result from accident, miscalculation, and misunderstanding in peacetime. The NRRCs required two rounds of negotiations, January 13 and May 3-4.

Authority for concluding the NRRC derives from the authority vested in the President as Commander-in-Chief under Article II, Section 2, US Constitution, and his authority to conduct foreign relations under Article II, Sections 1 and 3, US Constitution, as exercised on a day-to-day basis by the Secretary of State under 22 USC 2656.

Under the agreement, each side will set up a Nuclear Risk Reduction Center in its capital. The US center will be staffed by Americans, the Soviet center by Soviets. The centers will communicate at the Government-to-Government level by direct satellite links that can transmit rapidly full texts and graphics. In this respect the centers will be very similar to, but independent of, the modernized "Hotline" which is reserved for Heads of Government. The centers are not intended to supplant existing channels of communications or have a crisis management role. The NRRCs will exchange information and notifications as required under certain existing and future arms control and confidence-building measures agreements.

The United States has a long-standing commitment to seeking improved confidence-building measures as part of an overall effort to establish a more stable and secure world. Since the early 1960s, the United States and the Soviet Union have agreed on a number of measures to reduce the possibilities for misunderstandings and miscalculations that might increase the risk of nuclear war. For example, in 1963 the United States and the Soviet Union agreed to establish a direct communications link between their leaders -- the "Hotline." As a result of US initiatives, further improvements to that system were agreed upon in 1971 and 1984, the latest upgrade becoming operational in 1986. In 1971, the United States and the Soviet Union concluded the Agreement on Measures to Reduce The Risk of The Outbreak of Nuclear War, commonly called the "Accident Measures" Agreement, which requires notifications in the event of certain nuclear-related incidents. In 1985, again as a result of a US initiative, the two sides signed a "Common Understanding" to that agreement clarifying their obligations under it.

Nuclear Testing

US and Soviet technical experts held three sessions of discussions on nuclear testing issues in Geneva during 1987. During these meetings, the sides strove without success to reach agreement on the agenda and goals for nuclear testing negotiations. In Moscow, at the April Ministerial

meeting, this problem was also addressed, as well as in Washington in discussions between US and Soviet officials during the summer. Despite these efforts, there was still no agreement by September.

At the September 15-17 Ministerial meeting in Washington, the problem of the agenda for the negotiations was taken up again, and agreement was announced on September 17 through the following joint US-Soviet statement:

> The US and Soviet sides have agreed to begin before December 1, 1987, full-scale stage-by-stage negotiations which will be conducted in a single forum. The first objective at these negotiations will be an agreement on effective verification measures which will make possible the ratification of the US-USSR Threshold Test Ban Treaty (TTBT) of 1974 and the Peaceful Nuclear Explosions Treaty (PNET) of 1976, and proceed to negotiating further intermediate limitations on nuclear testing leading to the ultimate objective of the complete cessation of nuclear testing as part of an effective disarmament process. This process, among other things, would pursue, as the first priority, the goal of the reduction of nuclear weapons and, ultimately, their elimination. For the purpose of the elaboration of improved verification measures for the US-USSR Treaties of 1974 and 1976 the sides intend to design and conduct joint verification experiments at each other's test sites. These verification measures will, to the extent appropriate, be used in further nuclear test limitation agreements which may subsequently be reached.

The first session of these full-scale negotiations, held in Geneva November 9-20, was devoted to working out details for conducting the joint verification experiments. The results of the session were announced by Secretary Shultz and Soviet Foreign Minister Shevardnadze December 9 during the Washington Summit. The United States and the Soviet Union had agreed to conduct the experiments as soon as possible at their test sites (Nevada and Semipalatinsk). For the purpose of the joint experiment, each side will provide the other with an opportunity to measure the yield of one or two explosions at each test site with yields not less that 100

kiloton and approaching 150 kiloton. The experiment will include the use of the US Continuous Reflectrometry for Radius versus Time Experiment (CORRTEX) technique for yield measurement. Furthermore, in order to help prepare for the joint experiment, the United States and the Soviet Union agreed to exchange visits of the delegations to the two test sites in order to familiarize themselves with site conditions and operations. The US delegation is scheduled to visit Semipalatinsk January 11-14, and the Soviet delegation will visit the Nevada Test Site January 26-29, 1988. The next negotiating session will be held following these visits.

Standing Consultative Commission

The Standing Consultative Commission (SCC) was established under Article XIII of the ABM Treaty concluded by the United States and the Soviet Union on May 26, 1972. The SCC is charged with promoting the objectives and the implementation of the provisions of that Treaty and the Accident Measures Agreement signed by the United States and the Soviet Union September 30, 1971.

The SCC met in Geneva twice during 1987 in Geneva to discuss ABM Treaty issues of concern to the two sides. The first regular 1987 session (SCC-XXXIII) was held from March 18 to April 27; the second regular session (SCC-XXXIV) was held from September 16 to November 5.

ACDA provides the US Component of the SCC a Washington base of operations and plays a leading role in interagency preparation for the SCC sessions by chairing the SCC Backstopping Committee. In addition, ACDA also provides a technically qualified representative and a lawyer to the Component while it is involved with discussions with the Soviets in Geneva.

3 - MULTILATERAL ARMS CONTROL

Progress during 1987 toward the INF agreement and a possible START agreement generated a healthy debate concerning the questions and opportunities of a post-INF world. In response, US and NATO Ministers identified conventional forces in Europe and chemical weapons as two areas

requiring priority attention as the United States and Soviet Union proceed toward radical reductions in their strategic nuclear forces. The impetus thus given to these two nonnuclear issues generated considerable activity in multilateral arms control this year.

The United States and Soviet Union held three bilateral sessions on a convention banning chemical weapons worldwide, complementing the ongoing negotiations in the Conference on Disarmament where the momentum began in 1986 in addressing the complicated issues involved in this undertaking.

Regarding conventional arms control, NATO and Warsaw Pact countries began discussions on a mandate for future conventional stability talks which would address the elimination of disparities in conventional forces in Europe.

Perhaps the most significant aspect of multilateral arms control was the first year's implementation of the Stockholm Document on Confidence- and Security-Building Measures (CSBMs), under which a total of 43 military activities were notified and five on-site inspections (OSI) of military activities were conducted.

Conventional Arms Control in Europe

Conventional Stability Talks

As a result of the Halifax and Brussels statements, issued by NATO Ministers in May and December 1986, and the Budapest Appeal, issued by the Warsaw Pact in June 1986, the 23 states of the two alliances met for the first time in Vienna on February 17 to begin discussions on a mandate for a future negotiation on conventional stability in Europe, from the Atlantic to the Urals. Three sessions were held in 1987.

On June 12, in Reykjavik, NATO Ministers confirmed support for resuming the Stockholm Conference on Disarmament in Europe (CDE) to continue work on confidence- and security-building measures among the 35 Conference on Security and Cooperation in Europe (CSCE) states. In addition, Ministers confirmed support for distinct negotiations on conventional stability in Europe, which would be conducted within the framework of the CSCE process but limited in participation to the 23

members of the two alliances. In accordance with the Reykjavik Statement, the West tabled on July 27 a draft mandate for future negotiations on conventional stability.

On December 19, Western and Eastern negotiators concluded their third round of discussions by registering agreement on the objectives and methods that will guide the future negotiations. They agreed that the objectives will be:

- o to strengthen stability and security in Europe through the establishment of a stable and secure balance of conventional armed forces, which included conventional armaments and equipment, at lower levels;
- o to eliminate disparities prejudicial to stability and security; and
- o to eliminate, as a matter of priority, the capability for launching surprise attack and for initiating large-scale offensive action.

It was agreed that each participant would undertake to contribute to the attainment of these objectives. It was also agreed that these objectives would be achieved by the application of militarily significant measures, such as reductions, limitations, redeployment provisions, equal ceilings, and related measures.

East-West efforts to draft a mandate for the future conventional stability talks resume on January 25, 1988. Major issues remain to be resolved, beginning with the Soviet refusal to admit its overall conventional superiority. So far, the Soviets have conceded only that disparities in certain categories of forces do exist. In published articles, Warsaw Pact authors admit to slight superiority only in tanks, and claim that NATO is numerically superior in tactical aircraft and anti-tank weapons. In fact, the Warsaw Pact is numerically superior to NATO in all major armament categories, including tanks, artillery, armored fighting vehicles, anti-tank weapons, attack helicopters, and aircraft.

Another major problem concerns Soviet insistence that "tactical" nuclear weapons be included in the conventional talks.

The major threat to stability in Europe in the conventional field is

the Soviet Union's forward-deployed, tank-heavy forces which, in terms of their deployment, structure, equipment, and training, reflect an offensive war-fighting strategy. In Eastern Europe, these forces are organized into 30 divisions replete with the most modern tanks, artillery, armored fighting vehicles, and attack helicopters, and backed up by large numbers of similar divisions in the USSR, all of them west of the Ural Mountains. In any conventional stability negotiations, a Western priority must be to eliminate the disparities in capability represented by these forward-deployed forces and those with similar armaments stationed in the Soviet Union.

Mutual and Balanced Force Reductions Talks

In the meantime, the Mutual and Balanced Force Reductions (MBFR) talks involving 12 NATO states and the seven members of the Warsaw Pact continued to debate force reductions in Central Europe. While the negotiations made no progress this year, NATO continued to press for a constructive Eastern response to the West's December 1985 proposal, wherein NATO agreed to defer its long-held requirement for agreement on existing force levels prior to treaty signature. Unfortunately, in 1987, as in 1986, the Warsaw Pact remained intransigent. The three rounds of talks held this year saw some clarification of positions but no movement on the part of the Warsaw Pact in responding to the Western proposal. The MBFR negotiations will resume in January 1988.

Stockholm CDE

This was the first year of implementation of the CDE which was adopted in September 1986 by the 35 states participating in CSCE. The Document identifies a set of CSBMs designed to reduce the risk of military confrontation and to increase openness about and predictability of military activities taking place in Europe.

The specific CSBMs include an annual forecast of notifiable activities; 42-day advance notification of individual activities above a threshold of 13,000 troops or 300 tanks if organized into a divisional structure, and of amphibious landings and airborne assaults involving 3000

or more troops; invitations to observers from all other CSCE states to military activities involving 17,000 or more troops; and OSI of military activities for verifying compliance.

In general, the first years' implementation proved to be satisfactory. While errors were made by many states in the crafting of individual notifications, and technical problems sometimes caused delays in receipt of the notifications, such initial confusions were to be anticipated and should be worked out as states become accustomed to the various requirements of the Stockholm Document.

In all, 43 military activities were notified by the participating states. Observers attended 17 of these activities. Six NATO states notified a total of 16 different military activities, including two amphibious landings. Six Warsaw Pact states notified a total of 25 different military activities, including two Soviet airborne activities. Of the neutral/non-aligned states, Austria and Yugoslavia each carried out one notifiable activity. (Switzerland forecast three military activities but subsequently announced that they had been scaled back below the notification threshold.)

Of greatest significance was the implementation of the Document's provisions for OSI of military activities without right of refusal. In August, the United States inspected a notified military activity in the Byelorussian Military District in the Soviet Union. In September, the United Kingdom inspected a notified military activity in the German Democratic Republic. In early October, the Soviet Union inspected an unnotified (because troop levels were less than the notification threshold) US amphibious landing in Turkey, and followed soon after with a second inspection of a notified activity in the Federal Republic of Germany. Finally, in November, the German Democratic Republic inspected another notified activity taking place in the Federal Republic. The United States believes that OSI as a matter of right should be an integral part of all arms control arrangements, and welcomes the fact that other

participating CSCE states have exercised their rights to conduct inspections under the Stockholm Document.

CDE Resumption

On January 27, the Review Meeting of the CSCE resumed in Vienna to assess implementation of the Helsinki Final Act, assess results of the Stockholm Document on confidence- and security-building measures agreed in 1986, and, among other things, consider mandating a follow-on to the Stockholm CDE.

On July 10, in accordance with the NATO Reykjavik Statement, the West tabled, at the CSCE Review Conference, a draft mandate for the resumption of the CDE. Other participating states have presented mandates as well, and the Conference is currently engaged in the drafting of a Final Document of the Vienna CSCE Review Meeting, one section of which will be the mandate for the CDE follow-up meeting.

In keeping with long-standing US policy concerning the need for a proper balance among the three "baskets" of the CSCE process, and in particular between security and human rights, the United States will not agree to a resumption of the CDE unless and until a satisfactory outcome is achieved on all elements of the Final Document. The Vienna Review Conference resumes in January 1988.

Conference on Disarmament

Widely regarded as the principal forum for the negotiation of multilateral arms control agreements, the Conference on Disarmament (CD) has been in existence in its current format since 1979. A total of 40 states, including all five nuclear weapons states, are participants. Several members of NATO plus Japan and Australia form the Western Group, all Warsaw Pact states plus Mongolia form the so-called "Socialist Group", 21 neutral and non-aligned states form a third group, and China acts independently from any group.

The CD meets in Geneva in an annual session usually lasting from February through August, with a break during the month of May which

divides the session into spring and summer rounds. Intersessional meetings on specific subjects may also be conducted.

Eight items comprised the agenda for the CD during 1987, although each agenda item did not command equal attention by the Conference. The establishment of ad hoc committees to deal with each agenda item is dependent on a mandate for each distinct committee. Where consensus is not possible, the conference limits its discussion of specific agenda items to plenary session or to informal arrangements worked out by the conference president.

Ad hoc committees were established during 1987 on the following items:

- o Chemical Weapons;
- o Prevention of an Arms Race in Outer Space;
- o Effective International Arrangements to Assure the Non-nuclear States Against the Use or Threat of Use of Nuclear Weapons;
- o Radiological Weapons; and
- o Comprehensive Program of Disarmament.

The principal work of the CD centered on chemical weapons, and is discussed in detail below. The agreed mandate which established the ad hoc committee on the Prevention of an Arms Race in Outer Space was a nonnegotiating mandate which allowed the discussion of pertinent issues, but precluded negotiation of a text. This ad hoc committee met 18 times in 1987. US experts continued to provide legal analyses to illustrate the protection afforded by the current legal regime governing outer space. The 1987 report of the ad hoc committee recognizes the significance of the outer space legal regime in preventing an arms race in outer space; the need to consolidate and reinforce that regime and enhance its effectiveness; and the importance of strict compliance with existing agreements, both bilateral and multilateral. The report recommends reestablishment of the committee with an adequate mandate at the start of the 1988 session.

No ad hoc committees were formed for the other items on the agenda

inasmuch as there was no consensus on possible mandates dealing with those subjects. These were:

- o Cessation of the Nuclear Arms Race and Nuclear Disarmament;
- o Prevention of Nuclear War; and
- o Nuclear Test Ban.

Chemical Weapons

After years of refusing to admit to possessing a chemical weapons (CW) capability, the Soviet Union finally acknowledged in March that it had CW stocks. In early April, the Soviet Union announced that it had ceased production of CW and was building a CW destruction facility near Chapayevsk/ In October, the Soviet Union hosted a visit by delegations to the Conference on Disarmament to the USSR's CW facility at Shikhany. In November, a Soviet delegation visited the United States' CW destruction facility at Tooele, Utah. (The Soviet Union had previously declined to participate in a workshop on verification of CW destruction which the United States had hosted at Tooele for CD delegations in 1983.)

These events, coupled with the ongoing discussion of issues arising from the draft convention tabled in 1984 for a comprehensive and verifiable ban on CW, raised the visibility of the CW negotiations in the context of both the multilateral ad hoc Committee in the Conference on Disarmament and the bilateral talks held pursuant to the US-Soviet Summit in Geneva in 1985.

Security concerns underlying the negotiations in recent months have been addressed with greater seriousness, with particular emphasis on verification issues. Some convergence of views on challenge inspection has become apparent, but there has been no agreement on the details of a challenge inspection regime. This trend was influenced in large part by what appears to be Soviet acceptance of long-standing Western proposals for verification measures. The most visible example of this trend took place in August, when Soviet Foreign Minister Shevardnadze accepted in principle mandatory short notice OSI as a necessary element of an effective verification regime.

Despite these moves by the Soviet Union, the 40-nation Conference has many difficult issues to resolve before a comprehensive ban can be said to be possible. For example, the conference must identify and negotiate detailed procedures necessary to assure effective verification. These include arrangements for monitoring nonproduction of chemical weapons by the civil chemical industries of all parties and procedures for effective mandatory challenge inspections, which protect sensitive national security information not related to chemical weapons. In addition, participants must deal with the risk posed to their security interests by the possibility that states possessing chemical weapons may not become party to a CW convention, and with the need to ensure the security of all parties during the period of stockpile destruction. Moreover, the structure, operation, staffing, and funding of the international body that will implement and monitor the convention have yet to be developed.

The United States unilaterally ceased production of CW in 1969; in the years that followed, the Soviet Union not only produced large quantities of CW but also upgraded its CW capabilities. Today, as a result, there is a serious East-West imbalance in these weapons. The Soviet Union possesses a formidable, modern CW arsenal while the US capability -- much of it unusable and dating from the 1940s and 1950s -- has largely lost its deterrent value. It is essential, therefore, while negotiations continue and until US verification concerns are satisfied and all CW arsenals are eliminated, that the credibility of the Western deterrent be restored.

The importance of the CW negotiations in the Conference on Disarmament is underscored by the fact that chemical weapons continue to be used in contravention of international agreements. Toxins and chemical warfare agents have been used by the Soviets in Afghanistan, and by the Laotians and Vietnamese, with Soviet assistance, in Laos and Kampuchea. Chemical weapons have killed soldiers on both sides in the Iran-Iraq war. There have also been allegations of use by the Libyans in Chad. Moreover, the threat of proliferation of CW to additional countries remains real.

The US Government has urged international investigations of CW use and has taken actions to stop the proliferation of CW. For example, the United States has engaged in talks with allies and friendly countries to stem the flow of chemicals useful in the manufacture of CW to Gulf War belligerents. Furthermore, another US-Soviet bilateral meeting, conducted apart from the CD, was held in 1987 in Bern, Switzerland, to discuss efforts undertaken by each country to halt the spread of CW.

Group of Scientific Experts

The Conference's ad hoc Group of Scientific Experts to Consider International Cooperative Measures to Detect and Identify Seismic Events (GSE) met twice in 1987. The GSE considered technical issues pertaining to a new design for an international network to exchange large quantities of original data, i.e., seismic waveform data. The Group also considered the design and conduct of a series of experiments to exchange such data. In this regard, the United States hosted in Washington, October 26-30, a technical workshop on the design and functions of an international data center. The GSE submitted its report to the Conference on Disarmament as Document CD/778 in August.

BWC Experts Meeting

At the Second Review Conference of the Biological and Toxin Weapons Convention (BWC) in September 1986, States Parties to the Convention agreed to implement data exchange measures to enhance confidence and to promote cooperation in areas of permitted biological activities. In accordance with the Final Declaration, an ad hoc meeting of scientific and technical experts was held March 31-April 15.

At this experts meeting, modalities were finalized for the exchange of information and data on the following items: research centers and laboratories with "high containment" facilities or those engaged in permitted biological activities directly related to the Convention; "unusual" outbreaks of infectious diseases and similar occurrences caused by toxins; publication of certain biological research results; and active

promotion of contacts among researchers. States Parties submitted this data and information to the UN Department for Disarmament Affairs October 15.

United Nations

The Multilateral Affairs Bureau devotes a great deal of time and energy to the question of United Nations (UN) involvement in questions of arms control and disarmament. The United States recognizes that the General Assembly and the Disarmament Commission are the only forums available for many countries to participate and express themselves on these questions, and for that reason, the United States supports these forums and the exchanges of view made possible. At the same time, the United States is realistic about the difficulty in marshalling an international commitment to work toward positive action when many countries refuse to deal seriously with issues in their own regions, and prefer to resort to ideological and unrealistic rhetoric. The United States continues to take a principled approach to issues at the United Nations, supporting those efforts which are consistent with US national policy and which seriously contribute to international dialogue, stability, and security.

UN Disarmament Commission

The United Nations Disarmament Commission (UNDC), a subsidiary body of the General Assembly designated to deliberate on arms control and security issues, is composed of all UN member states and meets annually in New York. In contrast to the General Assembly, the UNDC does not vote on resolutions. The 1987 session of the Commission was held May 4 through May 29 under the chairmanship of Bulgaria. The agenda included five items carried over from 1986 (nuclear/conventional disarmament, reduction of military budgets, South Africa's nuclear capability, review of the UN role in disarmament, and naval arms and disarmament) and two new items (conventional disarmament and verification in all its aspects). The most positive development of this year's session was the fact that an agreed substantive report proved possible on the new item of verification, which

in effect endorses the US position that verification is of critical importance for arms control. Otherwise, deliberations on substantive issues remained largely inconclusive. The UNDC report to the General Assembly recommended continuation of deliberations at the next UNDC session on all items except for reduction of military budgets and naval arms and disarmament. Future actions concerning reduction of military budgets have been left for the General Assembly to decide. At US insistence, the topic of naval arms and disarmament was discussed only informally and was not included in the final report; other delegations noted the subject should be pursued at the 1988 UNDC session.

UN General Assembly

The United Nations General Assembly held its 42nd session September 15-December 21. The First Committee, which is responsible for arms control and security matters, held its meetings October 12-November 18.

President Reagan addressed the General Assembly on opening day, giving his vision of movement toward a better and more peaceful world. The Deputy Director of ACDA addressed the First Committee on October 22, explaining US positions and policies on the full range of arms control issues and stressing the value of democratic institutions in achieving and preserving peace.

The US delegation introduced three resolutions in the First Committee. The first concerned compliance with arms control agreements and was virtually identical to the 1986 resolution which was adopted by consensus. This year's resolution added a paragraph seeking to underscore the importance of the subject by recommending it to the attention of the Third Special Session of the General Assembly Devoted to Disarmament. In presenting this resolution, US Ambassador Friedersdorf welcomed its adoption by consensus last year and urged its adoption by consensus this year, but cautioned that adopting a resolution such as this, even by consensus, does not mean that the international community can rest upon its laurels. Each nation must put into practice the principles to which

it subscribes. The US resolution was again adopted by the General Assembly by consensus.

The second US resolution condemned the illegal use of CW and the continued proliferation of chemical warfare capabilities. In order to reduce the number of resolutions concerning CW, the United States merged its resolution with an Australian resolution. The merged resolution condemned the use and proliferation of CW, encouraged nations to take appropriate action to restrict the export of chemicals with potential for use in CW, and served to broaden the role of and support for the Secretary General in his investigation of suspected CW use. The US-Australian resolution was adopted by the General Assembly by consensus.

In addition, the US delegation tabled a third resolution on the need for openness in military matters. The United States noted that the free exchange of views and information on disarmament and related international security issues among the citizenry of the United States has helped the US Government develop realistic and meaningful arms control measures. The United States urged all states to support open dissemination of information on their armaments programs and international security issues, and to respect the right of their citizens to assemble to express their views on these issues. Unfortunately, representatives of the Neutral and Non-Aligned group proposed amendments to this resolution which would have detracted from the fundamental principles upon which the resolution was based. The United States decided not to accept these amendments and therefore chose not to bring the resolution to a vote.

The General Assembly adopted by consensus a resolution setting May 31-June 25, 1988, as the dates for the Third Special Session Devoted to Disarmament to be held in New York.

4 - VERIFICATION AND COMPLIANCE

Verification is the technical, analytical, legal, and political process by which the United States evaluates compliance with existing arms

control agreements and obligations. The verification of arms control agreements may be said to have three distinct purposes:

First, verification serves to detect violations of an agreement (or to provide evidence that violations may have occurred), and hence to furnish, as far as is possible, timely warning of emerging threats to a nation's security arising from a violation of a treaty.

Second, by increasing the risk of detection and complicating any scheme of evasion, verification helps to deter violations of an agreement. The deterrent value of verification depends to a considerable extent on a potential violator's uncertainty as to the exact capability of the techniques used by the other party to monitor his compliance with an agreement -- a fact which highlights the importance of the secrecy regarding many of these techniques. This deterrent function presupposes knowledge that detection of a violation will involve some concrete response to the illicit activity.

Third, verification serves to build domestic and international confidence in the viability of an arms control agreement. At the same time, it provides an important safeguard against wishful illusions and possible manipulation of an atmosphere of trust in the pursuit of unilateral advantage.

Soviet Noncompliance

The US Government has determined that the Soviet Union has violated one or more provisions of many of the bilateral and multilateral arms control agreements to which the United States and the Soviet Union are parties. Six classified and unclassified versions of Congressionally-mandated Presidential reports on Soviet noncompliance have been forwarded to Congress: January 1984, February 1985, December 1985, December 1986, March 1987, and December 1987. ACDA, by statute, played a key role in the preparation of these reports.

The reports included a thorough analysis of the Soviet Union's obligations under existing arms control agreements based upon the specific terms of these agreements and, where necessary, on the negotiating

record. The US Government used the best information and analytical resources available in addressing compliance questions, and employed a high standard of evidence to determine whether or not the Soviet Union was in compliance. Careful consideration was given to possible uncertainties and ambiguities inherent in some of the evidence or analytical methods, and where these existed, no violation was charged or findings were qualified by terms such as "likely" or "probable."

Since much of the data gathered by national technical means (NTM) of verification is sensitive and confidential, information that led to the conclusions cannot be fully disclosed on an unclassified basis. The compliance findings are, however, as comprehensive as possible within these sensitivity constraints.

After extensive study, the US Government found that the Soviet Union has violated one or more provisions of the 1972 Antiballistic Missile (ABM) Treaty, the SALT I Interim Agreement, the SALT II Treaty, the 1925 Geneva Protocol as reflected in the rules of customary international law, the 1972 Biological and Toxin Weapons Convention, the 1963 Limited Test Ban Treaty, and the 1975 Helsinki Final Act. In addition, the US Government concluded that it is likely that the USSR has violated the 150 kiloton threshold limit of the 1974 Threshold Test Ban Treaty.

The US Government has raised compliance issues with the Soviet Government on numerous occasions and through numerous diplomatic channels, including the Standing Consultative Commission (SCC), which meets twice annually. In doing so, the United States has made it clear that it expects the Soviet Union to take positive steps to correct its noncompliance and to resolve the other compliance concerns. The Soviet Union has neither provided satisfactory explanations nor undertaken corrective action sufficient to resolve our concerns.

As reported in the December 1987 Noncompliance Report, the US Government charged the Soviet Union with a new violation of the ABM Treaty. This charge was based on the movement of a Flat Twin ABM radar and a Pawn Shop van, a component of an ABM system, from a test range near

Moscow to the Gomel Electronics Plant, a location outside of an ABM deployment area or ABM test range, A few days after the Noncompliance Report was made public the United States accepted a Soviet invitation to visit the Gomel and Moscow sites. A delegation of eight people, including one from the US Embassy in Moscow, visited the two sites December 20-21; a report on the delegation's findings will be released in early 1988.

Soviet noncompliance has been discussed with the Soviet Union at the highest level. President Reagan has raised Soviet noncompliance, including the Krasnoyarsk radar deployed in violation of the ABM Treaty, with General Secretary Gorbachev in Geneva and again during the October 1986 talks in Reykjavik and during the Washington Summit.

Effective Verification

Another important process relating to verification is the evaluation of the degree to which a prospective arms control proposal or provision is verifiable.

The process of determining whether a prospective agreement is effectively verifiable has two phases. The first phase is a technical and analytic process which weighs the present and programmed US collection, processing, analysis and reporting capabilities against the activities proposed to be limited. This analysis must take into account credible cheating scenarios and the high standard of evidence demonstrated to be necessary within the US Government in order to reach a decision that noncompliance has occurred. This phase provides an assessment of the "degree of verifiability," or the degree to which compliance with an agreement can be verified by identifying those "undetectable" evasion scenarios that could occur.

When the first phase is complete and the treaty-specific limitations of our technical verification capabilities have been identified, the second phase addresses whether verification is effective. This assessment takes into account the results of the first phase and considers other factors including:

- o domestic political factors;
- o the costs and risks of evasion;
- o the degree to which undetectable violations would pose a risk to US national security;
- o the past compliance record of the treaty partner;
- o the specific incentives that a party might have to violate an agreement;
- o the ease and speed with which it would be possible for the United States to deny the benefits derived from noncompliance;
- o the likely perceptions of the other party regarding US ability and willingness to nullify any advantages derived from noncompliance;
- o the impact on the arms control environment and bilateral relations in general of potentially unresolvable compliance concerns caused by limitations in technical verification capabilities.

Arms control agreements that are not effectively verifiable can, for a variety of political and military reasons, be more detrimental than beneficial to US national security. Undetected violations could pose a severe threat to US national security. For example, the covert stockpiling or deployment of ICBMs in numbers exceeding the ICBM inventory permitted by an arms control agreement would be a serious threat because the concealed missiles could serve as a secure reserve force to be used after an initial nuclear attack, or for the purpose of nuclear blackmail during an international crisis. Furthermore, suspicions of violation or evasion based on ambiguous evidence give rise to a situation in which the complying party cannot act to counter the activity even though these may pose a possible military threat. Effective verification is therefore an essential precondition for a viable arms control agreement.

Special Challenges for Verification

In recent meetings between Secretary of State Shultz and Soviet Foreign Minister Shevardnadze, verification was a key topic of conversation. The US side laid out in some detail its view on the central

role of verification in the arms control process and the need to negotiate concurrently measures that would provide for effective verification. In START, for example, verification ideas that were put forward call for a comprehensive exchange of data, on-site observation of reductions down to agreed levels, and an effective monitoring of remaining inventories and associated facilities, including on-site inspection (OSI) to supplement NTM capabilities. These concepts have been applied in the recently-signed Intermediate-Range Nuclear Forces (INF) Treaty as well.

While verification has always been a difficult process, numerous factors make the verification of future agreements even more complicated and crucial. The most important of these factors are: (1) the impact of the Soviet Union's record of noncompliance; (2) the scope of future agreements in which strategic and space systems must be considered; (3) the aim of future agreements to reduce or eliminate forces, making the risks to a complying party greater should the other side choose to violate; and (4) advances in technology that lead to smaller, more mobile and more easily hidden weapon systems that are difficult to detect.

ACDA is engaged in ongoing analysis of a series of complex issues regarding the verification of arms control agreements. Some of these problems are summarized below.

The Value of On-Site Inspection

OSI, by observers and instruments, may play a useful role in deterring violations at agreed locations (declared sites). The utility of OSI, however, is limited in that OSI only allows the inspector to verify at the time and place of the inspection. The value of this capability depends on how easily the action being monitored by OSI could be conducted at other times and places.

Mobile Strategic Ballistic Missile Systems

The Soviet Union has underway programs for at least two new mobile ICBMs. One, the SS-X-24, is intended to be deployed in a rail-mobile as well as fixed silo mode. The other, the SS-25, is being deployed as a road-mobile system. While mobile missiles are attractive from the

standpoint of increasing crisis stability, Soviet mobile ICBMs pose special challenges for verification.

New Soviet mobile land-based systems, because of their mobility, the concealment measures associated with their deployment, and the potential commonality of systems and support facilities with other military and civilian equipment and installations, pose serious verification difficulties. The United States proposes to ban such systems and any future agreement must include measures to meet the verification challenges associated with these systems.

Biological and Toxin Weapons

In September 1986, representatives from over 60 nations gathered in Geneva for the second Biological and Toxin Weapons Convention (BWC) Review Conference. At the Review Conference, the United States sought a serious review of the operation and effectiveness of the Convention. The United States raised its concerns regarding incidents in which the Convention had been violated and the need for those concerns to be resolved. The importance of resolving uncertainties about compliance was echoed by other countries, particularly Canada and Australia. Although the United States has concluded that the Convention has not been effective in the elimination of biological and toxin weapons, we reaffirmed our continuing adherence to its provisions and to the international norm against biological and toxin weapons which was established by the Convention.

As recognized by the States Parties to the Review Conference, recent advances in the field of biotechnology make effective verification of a BW agreement much more difficult today than 14 years ago, when the Biological Warfare Convention (BWC) entered into force.

The equipment which would be used to produce BW agents, such as toxins and viruses, is indistinguishable from that in which legitimate commercial bioengineered substances are now being produced around the world. The production equipment newly evolved in the commercialization of biotechnological methods can be housed in standard industrial or

manufacturing facilities that offer no distinctive sign of the kind of activity occurring within. For example, one small bottle partially filled with glass beads whose surfaces are covered with mammalian cells ideal for growing viruses now yields quantities of product that previously would have required much larger production facilities. In addition, the new type of biological production equipment can synthesize substances suitable for BW use within hours; test tube quantities of BW seed stocks can be fermented into large production quantities in three to four weeks.

Finally, the infrastructure required for a BW capability (e.g., munition-filling equipment, aerosolization and dissemination testing, and training) can be maintained overtly for breakout from an agreement, since it is essentially identical to the infrastructure required for a CW capability.

Nuclear Testing Verification

The United States has concluded that the Soviet Union has likely conducted numerous nuclear tests whose yields exceeded the 150 kiloton threshold of the 1974 Threshold Test Ban Treaty (TTBT). The uncertainty responsible for the finding of a "likely violation" arises from the large uncertainties inherent on determining the yield of an underground nuclear explosion using only teleseismic methods. We believe that no method of yield estimation based on information derived solely from seismic measurements or seismic theory can reduce the uncertainty to an acceptable level. Uncertainties that have been raised by analysis of Soviet tests cannot be answered definitively, and uncertainties in the yield estimation process cannot be sufficiently reduced without directly measuring the yield of Soviet tests with instruments which are inherently much more accurate than seismic methods.

The United States has identified in CORRTEX (page 50) a measurement technique which will reduce the uncertainty in yield measurement to an acceptable level and can do so without danger of compromising other sensitive information about the nature or performance of the nuclear device whose yield is to be measured. CORRTEX is a hydrodynamic yield

measurement technique that measures the rate of propagation of the underground shock wave from an explosion.

Implementation of a direct-yield measurement regime for verification of the TTBT and the Peaceful Nuclear Explosions Treaty (PNET) requires on-site presence at declared facilities, in this case the site of the nuclear tests. Negotiations of all logistical aspects of such on-site presence will be required. Logistical requirements include: the size and composition of the technical teams who would make the measurements; the quantity of equipment to be brought into the country; identification of allowed instrumentation; inspection of equipment by the party whose test is to be measured; establishment of housing, feeding, and transportation arrangements for the team making measurements; and procedures for sharing and transferring data from the country in which the test is to be performed.

The provisions of TTBT provide no mechanism for reducing the level of uncertainty of yield estimation to an acceptable level. Discussion of improved verification measures for the TTBT and the PNET was undertaken in the Nuclear Testing Experts meetings (NTEM) begun with the USSR on July 25, 1986. These meetings resulted from a proposal by President Reagan to General Secretary Gorbachev in March 1986 for meetings of technical experts to discuss nuclear testing issues. These talks were intended to enhance the exchange of information with the USSR on current monitoring technologies and programs. In particular, the United States has sought to reach agreement on verification improvements to the TTBT and the PNET.

On September 17 the United States and Soviet Union agreed to begin full-scale, stage-by-stage negotiations to develop effective verification measures for the TTBT and the PNET. These negotiations began in Geneva November 9.

INF Treaty Verification

As discussed earlier, on December 8, 1987, the United States and the Soviet Union signed an INF Treaty that provides for the elimination of all

US and Soviet INF missile systems. A central focus in the process of drafting the Treaty was to design and negotiate effective verification of the provisions. Inspection and Elimination Protocols detailing important verification procedures are included as an integral part of the Treaty. The Memorandum of Understanding contains a comprehensive exchange of relevant data. This Treaty calls for the most stringent verification regime in arms control history.

The INF verification regime reflects the fact that the Soviet Union has now agreed to the longstanding US proposal for the elimination of an entire class of US and Soviet missiles. It is less difficult to verify compliance with an agreement which bans a weapon system than one which permits a limited number of such weapons. The verification regime is based on the principles that ban ground-launched shorter-range INF missile systems and ground-launched intermediate-range INF missile systems as well as the production, flight-testing, and deployment of such missile systems. The treaty also prohibits future systems in this range. All existing missiles and launchers will have to be eliminated within three years. The Elimination Protocol details how the missiles, launchers and other equipment will be eliminated. Thus, elimination includes all existing and potential future types in this category of weapons system.

The United States has two basic verification objectives for an INF arms reduction agreement:

- o to decide whether or not observed Soviet actions are legal and
- o to discourage and to make difficult and costly any effort to have an illegal INF missile capability.

To achieve these objectives, we have established an effective verification regime for the elimination of US and Soviet missile systems under the terms of an INF Treaty with an effective mechanism to deter prohibited production, storage, or deployment of such systems.

The key elements of the INF verification regime, which provides for supplementing our NTM capabilities with specified cooperative measures as appropriate, include:

- o the requirement that all INF missiles and launchers be geographically located in agreed areas or in announced transit between such areas during the reductions period;
- o detailed exchange of data, updated as necessary, on the location of missile support facilities and missile operating bases, as well as the number of missiles and launchers, support structures, and equipment at those locations; (The data will also include the technical characteristics of those missiles and launchers.)
- o notification of movement of missiles and launchers between declared facilities;
- o baseline OSI to verify the initial number of missiles and launchers at declared missile support facilities and missile operating bases;
- o close-out OSI inspections to verify that a missile operating base or missile support facility declared to be no longer involved in INF missile activity is indeed clear of INF activity;
- o follow-on, short-notice inspections of declared facilities during the reductions period to verify residual levels until all missiles are eliminated;
- o short-notice inspections of former INF facilities in which we suspect illegal Soviet activities may be taking place;
- o additional cooperative measures including inspections and a permament presence at certain missile facilities in each country for a period of thirteen years; and
- o detailed procedures for the conduct of inspections which are contained in the Inspection Protocol.

This INF verification regime, which is fully supported by our Allies, reflects President Reagan's longstanding insistence that any arms control agreement must be effectively verifiable if it is to improve stability and to make a lasting contribution to peace and security.

In summary, the INF verification regime will provide the most stringent verification of any arms control agreement in history.

5 - NUCLEAR NONPROLIFERATION

Preventing the further spread of nuclear weapons is a fundamental objective of US national security and foreign policy. During 1987, we continued our efforts to strengthen all elements of the international nonproliferation regime, including particularly the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and the International Atomic Energy Agency (IAEA). The United States also engaged in bilateral and multilateral discussions on nuclear cooperation, export control, and safeguards policies designed to promote our nonproliferation objectives and reduce the risk of nuclear proliferation. Negotiations with Japan on a new agreement for nuclear cooperation were successfully concluded.

In 1987, considerable attention was again focused on the nuclear threshold countries, i.e., those countries that are pursuing sensitive nuclear technologies but have neither foresworn a nuclear weapon option nor accepted international safeguards inspection of all their nuclear activities. The United States continued its active efforts to persuade these states that a legally binding obligation not to acquire nuclear weapons and acceptance of IAEA safeguards on all their nuclear activities are the best ways to assure their neighbors and the rest of the world that their nuclear programs are truly peaceful. Failure to accept such undertakings creates suspicion and mutual distrust about a state's nuclear ambitions and can lead to regional instability.

Buttressing Nonproliferation Institutions

Nuclear Non-Proliferation Treaty

The NPT is the cornerstone of international efforts to prevent the further spread of nuclear weapons. With 136 parties plus one former dependency, St. Christopher-Nevis, which is considered to be legally bound by the Treaty, and Taiwan, the NPT is the most widely adhered-to arms control agreement in history. (See Appendix III.) Under the NPT, nuclear weapon state parties undertake not to transfer nuclear explosives to nonnuclear weapon states or to assist such states to manufacture nuclear

explosives. Nonnuclear weapon states that are party to the NPT undertake not to acquire nuclear explosives and to accept IAEA safeguards on all their peaceful nuclear activities.

The NPT also commits its parties to cooperate in the development of the peaceful uses of nuclear energy. In its continuing effort to strengthen the NPT, the United States has extended preferential treatment to NPT parties in the area of peaceful nuclear cooperation. Much of this assistance is channeled through the IAEA.

The United States has long supported universal adherence to the NPT, a goal which the 1985 NPT Review Conference endorsed as the best barrier against nuclear proliferation. In 1987, ACDA continued its efforts to encourage states to join the Treaty. On November 5, Spain deposited its instrument of accession. Spain's adherence demonstrates the continued vitality of the NPT regime. It also reconfirms that states with developed nuclear programs can undertake a legally-binding commitment not to acquire nuclear weapons and still take full advantage of the benefits of the peaceful uses of nuclear energy.

Nuclear Weapon Free Zones

Nuclear weapon free zones, under appropriate conditions, can provide a valuable mechanism for states to demonstrate their commitment to nonproliferation.

The Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco) established the first nuclear weapon free zone in a populated area. It was opened for signature in 1967 and is currently in force for 23 Latin American countries. The Treaty is not yet in force, however, for Argentina and Brazil, which have the largest nuclear programs in Latin America, or for Chile and Cuba. The United States continues to hope that these states will join their regional neighbors and undertake Tlatelolco's obligations not to acquire nuclear weapons and to accept IAEA safeguards on all their peaceful nuclear activities.

In April, the Organization for the Prohibition of Nuclear Weapons in Latin America (OPANAL) held its Tenth General Conference of Tlatelolco

parties. OPANAL is the administrative organization established by the Tlatelolco Treaty to ensure compliance with the obligations of the Treaty. The United States attended the General Conference as an observer. ACDA's Assistant Director for Nuclear and Weapons Control headed the US observer delegation. At this meeting, the parties exhorted the eligible nonparties to join the Treaty.

The United States has strongly supported the Treaty of Tlatelolco and is a party to the Treaty's two Additional Protocols which are open to nonregional states with territories in the geographical zone and to nuclear weapon states, respectively. The United States accords Tlatelolco parties the same preferential access to peaceful nuclear cooperation as it does for NPT parties.

International Atomic Energy Agency: Political Developments

For thirty years, the IAEA has been at the center of international efforts to prevent the further spread of nuclear weapons and to foster the peaceful uses of nuclear energy. Established in 1957 largely at US initiative, the IAEA has statutory responsibilities to increase the contribution of nuclear energy to peace, health, and prosperity worldwide, and to ensure, to the best of its ability, that assistance provided through the Agency or under its control is not used to further any military purposes. In fulfilling this mandate, the IAEA administers a far-reaching system of international safeguards designed to protect against diversion of nuclear materials to military use. It also provided a range of technical assistance to member states including information, equipment and expert services.

The United States has been a staunch and generous supporter of the IAEA because of its vital contribution to US security and nonproliferation policies. Over the years, the IAEA has earned the admiration of the United States and the international community for the efficient and effective way in which it has conducted its work. When the 1986 accident at the Soviet Union's Chernobyl power station galvanized the international community's efforts to increase international cooperation on nuclear

safety, the IAEA was the focal point for these efforts. A most significant element of the international response to Chernobyl was the negotiation, under IAEA auspices, of two conventions that (1) provided for notification in the event of a nuclear accident with potential transboundary effects, and (2) provided a framework for assistance in the event of such an accident or other radiological emergency. In March 1987, the Administration transmitted both conventions to the Senate for advice and consent to ratification.

The IAEA continues to be the principal international channel for peaceful nuclear assistance in such areas as medicine, agriculture, safety and industry. The United States supports IAEA technical assistance programs, both through voluntary contributions to the Agency's Technical Assistance and Cooperation Fund and through voluntary "in-kind" contributions, such as equipment for research, cost-free experts, and training courses and fellowships for study in the United States. The United States exercises considerable discretion over the distribution of its in-kind contribution and gives preference to NPT and Treaty of Tlatelolco parties.

In 1987, attention in the IAEA was once again focused on issues involving Israel and South Africa. Despite the successful efforts of last year's IAEA General Conference to remove an item on Israel's nuclear capabilities from its agenda, Syria and Iraq requested that such an item be placed on the 1987 General Conference Agenda. The United States has consistently opposed efforts to introduce such extraneous political issues into the IAEA, because such controversies interfere with the IAEA's ability to carry out its responsibilities in the areas of safeguards, safety, and peaceful nuclear assistance to developing countries. A resolution placing an item on Israel on the 1988 General Conference agenda was adopted over the objections of the United States and others. No effort was made, however, to limit illegally Israel's rights and privileges of membership in the IAEA.

With respect to South Africa, the IAEA Board of Governors, at its June

1987 meeting, voted to recommend to the General Conference the suspension of South Africa's rights and privileges of membership. The United States strongly opposed the Board's action. Although the United States considers South Africa's apartheid system abhorrent, there is no justification under the IAEA Statute to suspend South Africa from the Agency. Suspension would, therefore, be illegal.

The United States also believes that suspension would seriously undermine efforts to obtain additional nonproliferation commitments from South Africa, including broader safeguards coverage of South Africa's nuclear facilities. President Botha's announcement that South Africa was prepared to begin negotiations on the possibility of signing the NPT was made at the beginning of the IAEA General Conference. This was a positive and welcome development. Subsequently, the 1987 IAEA General Conference adopted a resolution which deferred a final decision on South African suspension to the 1988 General Conference.

International Atomic Energy Agency: Safeguards Developments

The IAEA also plays a key role in nonproliferation by administering a system of safeguards that provide assurances to all states that safeguarded activities are devoted to peaceful purposes. The system is designed to deter the diversion of nuclear materials used in peaceful activities and to detect a diversion, if one were to occur. It comprises a comprehensive mixture of accountancy procedures, on-site inspections, and technical measures. Legally, the application of safeguards rests on more than 160 safeguards agreements between the IAEA and nearly 100 of its members states.

In carrying out these safeguards responsibilities, the IAEA, as stated in its 1986 Annual Report, applied safeguards on about 8,400 kilograms of separated plutonium; on about 195,000 kilograms of plutonium in irradiated reactor fuel; on over 13,000 kilograms of high-enriched uranium (HEU); on almost 28,000 tons of low-enriched uranium (LEU); and on 47,000 tons of natural and depleted uranium. Nearly 500 nuclear facilities were covered,

primarily in those nonnuclear weapon states where safeguards are applied to all peaceful nuclear activities. IAEA safeguards activities also include over 2,000 inspections per year, the verification of over 10,000 seals, the analysis of 1,000 samples, and the recording of almost 900,000 data entries into the IAEA's computer.

The United States strongly supports a vigorous program of diplomatic and technical assistance to ensure that the IAEA remains a viable institution able to carry out its safeguards responsibilities in a competent and efficient fashion. ACDA plays an integral part in these efforts and devotes substantial resources to strengthening safeguards. In 1987, the Department of State, the Department of Energy, ACDA, and the Nuclear Regulatory Commission continued to work in concert to improve the application of safeguards and to increase financial and human resources to meet additional safeguards obligations. ACDA safeguards experts worked directly with the IAEA on defining specific long-term safeguards goals, developing safeguards approaches and inspection activities, evaluating safeguards effectiveness, setting up quality control programs, and promoting US interest in IAEA staffing to ensure continued effectiveness. Under ACDA leadership, teams of safeguards experts met regularly with representatives of certain key allies to address problems which may be most efficiently resolved bilaterally. ACDA also played a lead role in developing advanced safeguards concepts for future civilian nuclear facilities which will process or use separated plutonium as a nuclear fuel.

Significant attention was focused this year on the human factors side of on-site safeguards inspections. Efforts were made to improve the quality of work performance by Americans in IAEA safeguards and to enhance the quality of interagency working groups on IAEA safeguards. Well qualified and highly motivated Americans are being recruited to serve at the IAEA. Development of an orientation program for preparing these Americans, and their spouses, to live and work overseas at the IAEA in Vienna, Austria, has been initiated. This program is being funded under the US Program of Technical Assistance to IAEA Safeguards and carried out

in collaboration with the Foreign Service Institute, which has much experience with training Foreign Service Officers and spouses, and the US Mission to the IAEA in Vienna, which deals with the IAEA and safeguards staffing issues.

Physical Protection of US-Origin Nuclear Materials Held By Other Nations

The Nuclear Non-Proliferation Act of 1978 (NNPA) sets forth the criteria governing the export of nuclear material and facilities from the United States. Criterion three states the following:

> "Adequate physical security measures will be maintained with respect to such material or facilities proposed to be exported and to any special nuclear material used in or produced through the use thereof."

ACDA is working with other US agencies involved in the approval of export licenses for nuclear materials to assure that this criterion is being met.

Further progress was made in this area February 8 when the Convention on the Physical Protection of Nuclear Material entered into force. Twenty-two nations have ratified the Convention which defines minimum standards of protection of nuclear materials in transport, provides a framework of cooperation in recovery and protection of stolen nuclear material, and contains procedures for international cooperation in the event of theft of nuclear material. The United States played an active role in drafting the Convention during 1979 and signed it in 1980. The Senate gave its advice and consent to ratification December 13, 1982.

Section 604 of the Omnibus Diplomatic Security and Anti-Terrorism Act of 1986 (P.L. 99-399) directed various executive branch agencies, including ACDA and the Nuclear Regulatory Commission, to review the adequacy of physical security standards currently applied to US-origin special nuclear materials outside of the United States. The ACDA report was forwarded to the Senate Committee on Foreign Relations and the House Committee on Foreign Affairs in October 1987. The basic finding of the report was that ACDA believes that the guidelines for the levels of

physical protection specified in various international agreements are adequate to establish an effective national physical protection system.

In order to lessen international commerce in weapons-usable nuclear materials, ACDA undertook the program management role for the Reduced Enrichment in Research and Test Reactors (RERTR) effort. This program seeks to convert research reactors so that they may use LEU fuel which cannot be used for nuclear weapons instead of HEU fuel. The RERTR program was initiated in 1978 and has already had major successes:

- o More than 20 countries are involved technically;
- o All of the major nuclear fuel fabricators, including the FRG, France, Canada, Argentina, South Africa, and the USSR, are developing the capability to manufacture the new LEU fuels;
- o Research reactor vendors are presently marketing only LEU reactors;
- o Although there are some technical and economic penalties for conversion, reactor operators are agreeing to convert their reactors and are undertaking safety and engineering studies in cooperation with the RERTR program;
- o US exports of HEU have decreased by more than 50 percent as foreign users draw down stockpiles anticipating the use of new LEU fuels; and
- o Fuels tested this year could result in a 70 percent reduction in HEU exports; fuels for the reactors requiring the remaining 30 percent will be tested by FY 1990.

Domestic Nuclear Export Control Efforts

ACDA continued to work with the other Executive Branch agencies involved with the export of nuclear-related commodities and technology to reduce administrative burdens imposed by the increasing number of export cases while maintaining our nonproliferation goals and objectives. A major interagency effort to develop guidelines for implementation of nonproliferation controls on computer exports which was started in 1986 was completed in 1987. In addition, these guidelines were expanded to

include major dual-use nuclear-related commodities, i.e., those that can be used for nuclear explosives but have other uses as well.

Peaceful Uses of Nuclear Energy Conference

The United Nations Conference for the Promotion of International Cooperation in the Peaceful Uses of Nuclear Energy was held from March 23 to April 10, 1987, in Geneva. This Conference was convened to review recent developments in the nuclear area and to assess both the prospects and problems for cooperation in upcoming years. The Conference provided a global forum in which to consider advancements in nuclear power and nonpower areas and their relationship to economic and social development.

Extensive efforts were made by the Conference to reach agreement on principles universally acceptable for inter- national cooperation in the peaceful uses of nuclear energy, as well as appropriate ways and means for the promotion of such cooperation, in accordance with mutually acceptable considerations of nonproliferation. Although the Conference reaffirmed that these matters were of major concern, the discussion in these areas was inconclusive but not divisive.

A noteworthy achievement of the Conference, however, was the presentation of many excellent technical papers covering a wide range of nuclear issues. The final Conference document recommended that these technical papers be published, because international exchanges of such information can aid in more widespread application of peaceful nuclear technology. The Conference also reaffirmed the important and central role which the IAEA plays in promoting cooperation among states in the use of nuclear energy for power production, medicine, agriculture, hydrology, and industry.

Bilateral Nonproliferation Discussions

The United States holds bilateral discussions on a variety of nuclear cooperation and nonproliferation issues with other countries each year. These discussions focus on matters primarily of bilateral concern as well as on issues affecting the international nonproliferation regime and attainment of US nonproliferation objectives.

Nuclear Cooperation Discussions

The Nuclear Non-Proliferation Act (NNPA) significantly changed US statutory requirements regarding peaceful nuclear cooperation with other countries and specifically called upon the President to seek to renegotiate all existing agreements for cooperation to incorporate the new conditions specified in the NNPA. In this regard, negotiations on a new agreement for cooperation with Japan were initiated in 1982. The negotiations were successfully concluded and the agreement was signed in Tokyo November 4. It has been transmitted to Congress for review, where it must lie for ninety days of continuous session before it may be brought into force. The agreement establishes a comprehensive framework for peaceful nuclear cooperation between the two countries based on shared nonproliferation objectives. In return for Japan's acceptance of the new obligations required by the NNPA, the United States provides advance, long-term consent for specified reprocessing and related use of plutonium in Japan's nuclear program as long as US statutory conditions are met, including strict safeguards and physical protection measures.

During 1987, the United States also held discussions with a number of other nuclear cooperation partners, particularly the European Atomic Energy Community (Euratom) and Canada, on issues related to cooperation under US agreements with those countries.

Nonproliferation Discussions

A regular feature of US nonproliferation activities over the past decade has been consultations with other major exporters of nuclear material, equipment, and technology. These discussions have aimed at enhancing international coordination in nonproliferation efforts, including support for the IAEA and IAEA safeguards and establishing and improving common export controls and conditions for nuclear cooperation. US consultations with key allies are frequent and take place at various diplomatic levels. Formal annual consultations are held with the UK and twice yearly discussions are held with Canada and the USSR. Nine rounds of discussions have been held with the USSR beginning in 1982. The most

recent discussions were held in Moscow in July 1987. These discussions generally last three to four days consisting of opening and closing plenary sessions, two working groups for detailed discussions, safeguards and export control topics, and private meetings between the heads of delegation. These meetings have proved to be quite useful, reinforcing the common interests of the United States and the Soviet Union in preventing nuclear proliferation.

The United States also holds technical discussions on safeguards issues, usually every six months, with the United Kingdom, France, West Germany, Japan, Australia, and Euratom. These discussions generally focus on the implementation of safeguards in these nations and on current and long-term safeguards issues. As part of this program of discussions on the more technical aspects of safeguards, we have had several joint discussions, most recently in November, with the United Kingdom, France, and West Germany, on safeguards for future commercial-size reprocessing plants.

Finally, the United States also holds occasional discussions with so-called "emerging supplier" countries, such as Argentina and Brazil. The United States encourages these countries to adopt nonproliferation practices and norms of the established supplier countries.

Regional Proliferation Issues

South Asia

India's nuclear test in 1974 and Pakistan's unsafeguarded nuclear program have placed South Asia in the forefront of proliferation concern.

During 1987, the United States continued to encourage India and Pakistan to adhere to the international nonproliferation regime, and has particularly encouraged regional measures aimed at curbing nuclear proliferation in South Asia. Pakistan has proposed several such measures, including simultaneous adherence to the NPT by India and Pakistan, establishing a South Asian nuclear weapon free zone, a bilateral prohibition against nuclear explosive testing, and mutual inspection by

India and Pakistan of each other's nuclear facilities. The United States has encouraged India to respond positively to these proposals or to put forward proposals of its own. US officials have repeatedly stressed to India and Pakistan the importance of preventing a nuclear arms race on the subcontinent. The United States has urged both sides, in the absence of multilateral or bilateral arrangements, to exercise unilateral restraint in their nuclear programs.

The President certified in 1986 that Pakistan does not possess a nuclear explosive device and that the US security assistance program significantly reduces the risk that Pakistan will possess such a device, thereby satisfying the legal requirement for continued security assistance to Pakistan. The United States has made clear to Pakistan, however, that certification that Pakistan does not possess a nuclear explosive device does not in any way constitute US approval of Pakistan's unsafeguarded nuclear program, and that we have serious concerns about the overall nature and direction of Pakistan's nuclear program. The President must again decide whether to certify that Pakistan does not possess a nuclear explosive device in order to provide security assistance to Pakistan in FY 1988.

In July, a Canadian citizen of Pakistani origin was arrested for allegedly trying to export illegally materials for use in Pakistan's nuclear program. As a result of the arrest, the President must now determine whether the transactions associated with the case triggered the Solarz Amendment of the Foreign Assistance Act on illegal exports. US officials have conveyed to the Pakistanis on several occasions the seriousness with which the United States views this apparent violation of US law. In August, a Pakistani delegation came to the United States to meet with US officials to discuss procurement activities and the US export control regime. The United States made clear to the Pakistanis that US law strictly precludes export of US-origin goods for use in Pakistan's unsafeguarded nuclear program and that the continuation of such activities would jeopardize the US-Pakistan relationship.

There have been reports that both India and Pakistan are continuing to explore the possibility of acquiring nuclear power reactors from foreign suppliers. The United States continued its diplomatic efforts during 1987 to discourage other suppliers from exporting power reactors to India and Pakistan in the absence of IAEA full-scope safeguards. The United States has also continued to urge other supplier countries not to export items to unsafeguarded nuclear facilities in India and Pakistan.

Latin America

Argentina and Brazil have the largest nuclear programs in Latin America; yet neither country has joined the NPT, which both oppose as "discriminatory," nor brought the Treaty of Tlatelolco into force. At the same time, both countries have nuclear facilities that are not covered by IAEA safeguards. Both countries also, however, have democratically-elected civilian governments that have publicly stated they have no plans to develop nuclear weapons.

Over the past several years, Argentina and Brazil have been engaged in a dialogue on nuclear issues that has been aimed at expanding cooperation and increasing mutual confidence in the peaceful nature of both countries' nuclear activities. We believe this dialogue is a useful means of reducing the potential for suspicion and concern created by the presence of unsafeguarded nuclear activities in a neighboring state. We hope that it will lead to further concrete nonproliferation measures. The United States continues to urge both countries to accept IAEA safeguards on all their peaceful nuclear facilities. We also continue to stress the security benefits afforded to all Latin American states by the entry into force for all eligible states of the Treaty of Tlatelolco.

The United States believes it is important to keep open the lines of communication with those states with which there may not always be full agreement on nuclear issues. We conduct an active dialogue with Argentine and Brazilian officials through periodic bilateral consultations. These consultations are designed to identify areas for cooperation such as safeguards and nuclear safety, and to promote a better understanding of

the interests and concerns both sides have in nonproliferation and on other nuclear issues.

Middle East

While Egypt, Syria, Jordan, Iraq, and Iran are parties to the NPT, Israel and several Arab states are not. The United States believes that it would enhance the security of all Middle Eastern states if all of them were to adhere to the NPT, or to an effective nuclear weapon free zone agreement which similarly contained a binding commitment not to acquire nuclear explosives and which required IAEA safeguards on all their nuclear activities. The United States will not provide significant nuclear assistance to states that do not have such comprehensive IAEA safeguards coverage, and has urged other suppliers to adopt the same policy. The political volatility and active hostilities in the Middle East constitute additional reasons for restraint in exporting nuclear materials and technology into the region.

6 - ARMS AND TECHNOLOGY TRANSFERS

In 1987, ACDA continued its active participation in the formulation and implementation of US policy on the transfer of conventional arms and military technology in order to ensure that arms control factors are given full consideration in the decision-making process.

ACDA's arms transfer activities are carried out within the framework of Administration policy and long-standing statutory requirements. The President's conventional arms transfer policy of July 1981 recognizes that arms transfers, judiciously used, can help deter aggression, strengthen our mutual security relationships, demonstrate our enduring interest in the security of friends and partners, and foster regional and internal stability. By helping to enhance stability the United States can encourage the peaceful resolution of disputes and evolutionary change in various parts of the world. Conventional arms transfers and security assistance can also play an important role in supporting our efforts to

influence nations which may be considering the acquisition of nuclear weapons. By helping friends and allies meet their legitimate defense needs, conventional arms can contribute to the self-confidence of such countries in their own security, thereby reducing possible pressures to acquire nuclear explosives.

Under the President's policy, each request for arms is carefully reviewed on a case-by-case basis, primarily in terms of its net contribution to enhanced deterrence and defense. A wide range of factors, including arms control factors, are considered in evaluating prospective transfers. These include: the degree to which the transfer responds appropriately to the military threats confronting the recipient; whether the transfer is consistent with US interest in maintaining stability within each region; whether the proposed transfer can be absorbed without overburdening the recipient's military support system or financial resources; and whether possible detrimental effects of the transfer are more than counterbalanced by positive contributions to US and regional interests and objectives. Requests for coproduction or the transfer of sensitive technology receive special scrutiny. Recognizing that first-line systems may not be appropriate to the needs of all countries, careful consideration is also given to lower-cost alternatives, including adaptations of US military equipment for sale abroad.

Under the Arms Export Control Act and the Foreign Assistance Act of 1961, as amended, decisions to transfer arms or provide military assistance are coordinated with the Director of ACDA, and the Director's opinion is taken into account on the extent to which proposed transfers or military assistance might:

- o Contribute to an arms race;
- o Increase the possibility of outbreak or escalation of conflict;
- o Prejudice the development of bilateral or multilateral arms control arrangements.

In carrying out this responsibility in 1987, ACDA evaluated and rendered

its opinion on about 1,500 Foreign Military Sales cases and commercial requests for licenses to export military equipment. Many of these cases involved the transfer of more than one item to more than one country.

In 1987, ACDA participated in various interagency committees and working groups concerned with arms transfer and security assistance issues. ACDA's Assistant Director for Nuclear and Weapons Control continued to represent the Agency on the senior-level interagency Arms Transfer Management Group, which assists the Under Secretary of State for Security Assistance, Science and Technology in advising the Secretary of State on arms transfer and security assistance matters. In addition, ACDA continued its participation in the Security Assistance Progam Review Working Group, which focuses on the development of proposed security assistance programs and legislation. As a member of this working group, the Agency reviewed proposed FY 1989 security assistance programs for each country in order to ensure that arms control considerations were fully taken into account in the development of these programs. In addition, the Agency prepared a general section on arms control considerations for inclusion in the Congressional Presentation Document on FY 1989 Security Assistance Programs.

The arms trade is marked by an increasing demand by arms recipients for offsets in the form of industrial and commercial compensation as a condition of military purchases. These offsets may include coproduction, licensed production, sub-contractor production, overseas investment, technology transfer, and countertrade. In 1987, ACDA continued its participation in the interagency working group which prepared for the Congress the annual report on the impact of offsets in defense-related exports required by the Defense Production Act Amendments of 1984. These reports address the impact of offsets on the defense preparedness, industrial competitiveness, employment, and trade of the United States.

Members of ACDA's Arms Transfer Division also wrote essays on Third World Arms Production and Exports and on US Arms Sales to China for

inclusion in the Agency's annual publication, World Military Expenditures and Arms Transfers.

Arms Transfers by Region

Arms transfers to Europe in 1987 continued to reflect the US commitment to maintaining the strength of the NATO Alliance in the face of an unrelenting Soviet/Warsaw Pact military threat. Military-sales and security assistance have been focused primarily on support for the force modernization objectives of the countries comprising NATO's critical southern flank. Balanced and systematic support of the equipment upgrade requirements of Greece and Turkey has contributed to the capabilities of these Allies to defend the vital land and sea approaches to the strategic eastern Mediterranean. On the Iberian Peninsula, US arms transfers have continued to assist Spain and Portugal in their modernization programs and have enabled them to assume increasingly active roles in the Alliance.

In the Middle East, activities in the Gulf were the focus of attention. US arms transfer policy remained directed toward responding to the security requirements of the moderate Arab monarchies of the Gulf Cooperation Council (GCC), which perceived themselves as more than ever directly threatened by Iran. Iranian Silkworm missile attacks on Kuwaiti territory and offshore oil-loading facilities, attacks against Kuwaiti and Saudi shipping, Iranian-inspired terrorist incidents in Kuwait, and the violent confrontation in Mecca during the Haj highlighted the diversity of Iranian threats to these countries.

Apart from these regional threats, the Soviet military presence also increased with additional naval deployments and enhanced security influence in this area -- a task that can only be accomplished with the military cooperation of friendly regional states. In pursuit of this cooperation, the Administration notified Congress of several significant arms sales (including replacement F-15 aircraft, and upgrades for the F-15s and US M-60A1 tanks) to Saudi Arabia. Discussions also continued on the possible sale of air defense missiles and modern fighter aircraft to some of the other GCC states.

In tandem with our arms transfer policy, the United States attempted to increase the diplomatic pressure on Iran to end the war with Iraq. This was highlighted by US sponsorship of the United Nations Security Council Resolution 598, calling for a cease fire, and by follow-up efforts to lay the groundwork for a subsequent resolution on sanctions. The United States also devoted considerable attention throughout the year to reinvigorating our "Staunch" program, which is aimed at cutting off the flow of arms to Iran.

Elsewhere in the Middle East, the United States remained committed to maintaining Israel's qualitative technological edge. The United States formulated proposals and made commitments to assist Israel in accomodating to the military and economic impact of the decision to terminate the Lavi aircraft program. Syria's acquisition of the new Soviet MIG-29 fighter aircraft increased the air threat to Israel and illustrated the growing modernization and sophistication of Syria's armed forces. The Soviet Union's agreement to settle Egypt's military debt to the USSR on terms favorable to Egypt provided impetus to a modest comeback for Soviet influence there and demonstrated the need for the US to remain forthcoming in support of Egypt's armed forces. ACDA continued to participate in the security assistance and arms transfer decision-making process leading to enhanced military capabilities for Israel and Egypt as well as for other US friends in the region.

ACDA was heavily involved in arms transfer issues in South Asia during the year, particularly because of growing concerns in the area of nonproliferation. In conjunction with providing a security assistance program designed to enhance Pakistani national security without recourse to nuclear weapons, the US continued to try assiduously to persuade Pakistan that the search for a nuclear weapons capability is neither necessary to its security nor in its broader interest as an important member of the world community. ACDA continued to play a major role in the Administration's efforts to balance security assistance for Pakistan against the demands of the nuclear nonproliferation regime.

With respect to India, ACDA contributed to the policy discussion on how the US can balance its relationships with India and Pakistan most effectively. Increased military cooperation between the US and India provides an alternative to India's reliance on the Soviet Union as a military supplier. On the other hand, we do not want to increase the military threat facing Pakistan or call into question US credibility as a reliable ally. ACDA's view has been that we should avoid enhancing Indian offensive military capabilities.

In North Africa, although Libya's military reputation suffered because of reversals in Chad, Libya's diplomatic prospects rose, highlighted by improved relations with Algeria and Tunisia. Libya also appeared to be on the verge of concluding new agreements for arms purchases from Brazil, a development of concern to US policymakers. US security assistance in North Africa was constrained by austere budgets, but the US continued to be as responsive as possible to the defense requirements of long-time allies Morocco and Tunisia. Military relations with Algeria remained at a low level despite the visit to Washington of the Secretary General of the Algerian Ministry of Defense.

In sub-Saharan Africa, Economic Support Funds continued to account for more than 80 percent of US security assistance for the region. When emergency humanitarian assistance is also considered, the percentage of economic aid is even greater. In 1987, what little US military assistance was provided to sub-Saharan Africa centered on training, logistics, maintenance, engineering, and transportation -- areas that contribute to basic military capability as well as to infrastructure improvements.

In only a few cases during the year did the US provide lethal equipment, and that has been to countries facing external aggression, as in the current situation in Chad. In 1987 the fighting inside Chad intensified between Chadian and Libyan forces. During the year, Chadian troops defeated the Libyans at Fada and Faya-Largeau. Libya, however, continued to occupy sections of Northern Chad. Elsewhere in sub-Saharan Africa, the US also provided limited materiel and training to Kenya,

Somalia, Sudan, and Zaire. In keeping with the United Nation arms embargo and US laws, the United States did not transfer any military equipment to South Africa.

In East Asia and the Pacific, US security assistance continued to support US interests in regional peace and stability. Arms transfers to the Republic of Korea were designed to enhance that ally's deterrence and defense capabilities against the threat of North Korean aggression. In the Philippines, US security assistance has been responsive to that country's urgent need for modern equipment and training to counter a growing insurgency threat. In southeast Asia, US arms transfers to Thailand have been designed to buttress Thailand's position as a frontline state against Vietnam's aggressive expansion into Cambodia. In order to increase stability in the region, the US has also provided security assistance and arms exports in support of the defense modernization objectives of the member states of the Association of Southeast Asian Nations. Foreign Military Sales and commercial exports of relatively modest amounts of defense articles to China also continued during 1987. US support for Chinese military modernization has taken into consideration the valid security concerns of other friendly countries of the region. Arms sales to Taiwan continued to reflect US compliance with our commitments under the Taiwan Relations Act and the United States/China Joint Communiques.

In 1987, US arms transfers and security assistance to Latin America and the Caribbean focused on continuing US support to pro-democratic forces. In Central America, the largest portion of United States assistance continued to be economic aid -- about four times the level of military aid. During the year, the bulk of US arms transfers went to El Salvador and Honduras to help defend these nations against internal and external threats.

In 1987, the United States also continued to support a negotiated solution to the crisis in Central America. The United States welcomed Costa Rican President Arias' proposal for peace in the region when it was

unveiled in February, 1987. On August 5, President Reagan and Speaker of the House of Representatives Wright presented a Bipartisan Plan for peace in Nicaragua, clearly stating US interests and objectives in Nicaragua: an end to Nicaragua's ties with the Soviet Union and Cuba; an end to Nicaragua's export of subversion; restoration of a regional military balance; and bringing democracy to Nicaragua. Attention has since been focused on the August 7 agreement signed by the five Central American presidents in Guatemala City, but the basic elements of the Wright/Reagan plan remain valid. A durable peace in Central America is only possible in the context of genuine democracy in Nicaragua. In 1987, ACDA continued to provide technical assistance to the Department of State in the analysis of the arms control aspects of the various peace proposals for Central America.

In the Andes, a significant beginning has been made in addressing the illegal production and trafficking of narcotics,and combating insurgents. To assist and encourage this trend, the United States continued to provide modest levels of military equipment to Bolivia, Colombia, and Ecuador. Similarly, modest amounts of military assistance were provided to the Caribbean countries of Jamaica, Dominican Republic, Haiti, and the Eastern Caribbean nations to nurture democratic development in the region and to maintain a reasonable ability to respond to threats to these island nations.

Technology Transfer

In the area of technology transfer, Third World arms producers continued to turn to the United States (as well as other major suppliers) for the technology needed to manufacture their own weapon systems. As a result, ACDA focused much of its attention in 1987 on the issues raised by requests for the transfer of technologies which could lead to an independent capability of Third World countries to produce advanced weapons. ACDA is involved in the interagency effort to ensure that civil space-related technology provided to other countries is used only for

peaceful purposes. This work complements ACDA's nuclear nonproliferation activities.

The year witnessed a significant advance in the effort to control the proliferation of nuclear-capable missiles. On April 16, 1987, the United States, Canada, the Federal Republic of Germany, France, Italy, Japan, and the United Kingdom separately announced common national policies to limit the proliferation of nuclear-capable missiles. These policies complement our joint efforts against the proliferation of nuclear weapons themselves. This Missile Technology Control Regime is not an international agreement, but rather a set of identical policies announced by seven countries. There is no international body to administer the regime. Rather, each of the adhering nations is responsible for its own actions.

The regime is designed to control those missiles (including cruise missiles) capable of the unmanned delivery of a 500 kilogram payload to a distance of 300 kilometers. These parameters correspond to the weight of a relatively unsophisticated nuclear weapon, to the strategic distances in the most compact theaters where nuclear-armed missiles might be used, and to realistic points were efficient control can be exercised.

In developing common export policies to deal with these projects, the seven countries defined in technical detail the items to be controlled. There are two categories of items controlled. First, the Category I list consists of complete rockets and missiles, major subsystems, and production equipment and technology. The regime establishes a strong presumption of denial with respect to export application for these items. A second list, Category II items, deals with components of missile systems. Since almost all of the Category II items have other uses than for missile projects of concern, there is flexibility in the treatment of Category II exports. The procedure is to give such export application a case-by-case review in order to examine the potential end use of each item.

The seven nations presently party to the regime are actively seeking

the adherence of other major suppliers of missiles and missile technology to the regime. ACDA has been an active participant in the development and implementation of the Missile Technology Control Regime.

7 - RESEARCH AND ANALYSIS

The ACDA statute authorizes and directs the Director "to exercise his powers in such manner as to insure the acquisition of a fund of theoretical and practical knowledge concerning disarmament." Research on all aspects of arms control and disarmament has been and continues to be one of ACDA's principal functions. While a great deal of research has been directed to the immediate requirements of ongoing negotiations, other projects involved research in support of the ultimate US "goal of a world free from the scourge of war and the dangers and burdens of armaments." Over the years, ACDA has accumulated a wealth of completed research on every conceivable aspect of arms control and disarmament. Most of that research was completed by agency officers in the normal course of their assignments; other research was carried out by private con- tractors under contract to the agency and under reimbursement agreements with other US Government agencies.

Research assistance within ACDA is provided by the library, the computer center, and the intelligence unit. Furthermore, the regular staff is bolstered by the addition of scholars-in- residence under the auspices of the William C. Foster Fellow- ship Program. Such academic disciplines as physics, chemistry, and mathematics have figured largely in research activity related to the negotiations and to the preparation of Arms Control Impact Statements. Research in the social sciences, particularly economics, has been relevant indirectly to negotiation support and directly to the accumulation of knowledge on arms control and disarmament.

Economics Research

One of the objectives of arms control is the reduction of global military expenditures. Research in support of this objective in 1987 was directed to analyses of the economic impact of the INF Treaty, defense spending and national budgets, and military procurement. ACDA economists reviewed Soviet and Eastern European countries' national accounts and prepared monographs on such issues as Gorbachev's economic reforms and their impact on Soviet military spending. The US defense budget was analyzed and prepared for submission to the United Nations as a part of the UN military expenditures reporting program. ACDA was represented at the 1987 NATO Economic Colloquim, "The Soviet Economy: A New Course", held in Brussels in April. ACDA was also represented at the UN meeting at Geneva in December concerned with Economic and Social Consequences of The Arms Race. Two interagency committees, each of which included an ACDA economist as a member, held sessions during the year; one committee was charged with preparing the third annual report to Congress concerning the impact on the US economy of the use of offsets in arms exports and the other with the problem of US arms transfers data collection.

The collection and analysis of economic, military expenditure, and arms transfer data from 145 countries together with the reporting of such data in the annual ACDA publication, World Military Expenditures and Arms Transfers, has caused ACDA to become a leading international source for information on country military programs. The 1986 edition of the report was published in May 1987 and the 1987 edition will be published in March 1988.

Weapons are the embodiment of scarce resources which have alternative uses. While defense spending is designed to meet a real or imagined external threat and presumably is in the best interests of a nation, such spending constitutes a diversion of resources from civilian investment and consumption. This diversion could cause over time a weakening of a country and, as a consequence, invite security problems. ACDA economists continue to investigate the impact of defense spending on national

economies and ways in which arms control can play an economic as well as a security role.

Operations Analysis and Computer Support

During the past year, there were substantial accomplishments in the areas of operations analysis and computer activities. During this period, the ACDA VAX computer has been fully operational as a classified computer system. This system now gives all Agency personnel ready access to both classified computations and classified information retrieval.

The classified computations are required for the mathematical and statistical analysis performed in support of the development of arms control options and for the development and evaluation of effective verification provisions for these options. A Base Case Study was completed with the use of a model which simulates the effects of a global nuclear exchange and evaluates the capability of nuclear forces. This study examined a variety of force structures and arms control options from both a US and Soviet point of view. It should provide some insight on the reasons for differences between the United States and the Soviet Union on certain proposals and may lead to possible areas of concordance. The Operations Analysis Division has begun an extended analysis phase of this study. This phase will focus on the impact of strategic postures on mobile missiles and on the strategic defense initiative. Future analysis phases will extend the time frame of the analyses past the year 2000.

In support of testing limitation verification requirements, ACDA continued to provide technical and administrative management of two Defense Advanced Research Project Agency external research projects:

- Statistical Aspects of Yield Estimation. Under this program, papers were completed on methods for improving seismic yield estimation capability and compliance decision procedures.
- Nuclear Monitoring Applications Analysis. The main purpose of this project is to assess the impact of various test ban scenarios on nuclear capability and, ultimately, on strategic stability.

A number of classified information retrieval systems have been

developed and are operational on the ACDA computer. These studies provided the statistical analysis and the geophysical information required for an interagency paper on threshold test ban verification which contributed to the US position for ongoing discussions with the Soviet Union. Other papers were written assessing, on the basis of seismic evidence, Soviet testing practices with regard to the 150 kt threshold limit of the TTBT.

The ACDA Library

The ACDA Library maintains a current collection of pertinent books, periodicals, documents, and reference materials. Also available through the Library are information retrieval systems and inter-library loan facilities. The collection complements the much larger Department of State Library collection.

External Research

ACDA, during FY 1987, sponsored external research covering a wide range of arms control issues. The topics included such general subjects as verification, nuclear safeguards, nuclear test ban monitoring and crisis stability issues.

Specific projects included studies on verification methodology and assessments, remotely monitored sensor systems, an international plutonium management system, reduced enrichment in research and test reactors, development of initiatives in international spent fuel management, nuclear test limitations and the Soviet test program, detection and identification needs for low yield threshold test ban treaties, and issues in quota limits on nuclear test limitations.

The Reduced Enrichment in Research and Test Reactors (RERTR) program was begun in 1978. The primary objective of the RERTR program is to minimize international commerce in highly enriched (weapons grade) uranium (HEU) required to fuel research and test reactors throughout the world by encouraging their conversion to low enriched uranium (LEU) fuel. The RERTR program, implemented through DOE's Argonne National Laboratory, has developed new high density LEU nuclear fuels which can be substituted for

HEU now in use. The provision of this technology plus the supply of technical assistance to the reactor operator for the relicensing of the reactors has expedited the conversion of the reactor cores. ACDA has strongly supported the objective of the program. DOE had been the fund source of the program but decided not to fund it in 1987. Since ACDA has the necessary legal authority and technical capability to carry out the program, it was decided to fund the program from ACDA research monies during 1987. The RERTR program is scheduled for completion in 1990. Due to its nonproliferation significance, ACDA fully supports efforts to bring the program to an orderly conclusion.

In addition, ACDA sponsored meetings and conferences to assess crisis stability issues such as the role of arms control during a transition to strategic defenses, the implications of strategic defenses on space and space relations, and the Soviet perspective and the offense/defense relationship.

Hubert H. Humphrey Fellowships in Arms Control and Disarmament

Hubert H. Humphrey Fellowships in Arms Control and Disarmament, designed to encourage specialized training and research in arms control, are sponsored by ACDA as a part of its legislatively mandated responsibilities for the conduct, support, and coordination of arms control research. Named in honor of Senator Humphrey, who was a strong arms control advocate, Humphrey fellowships are awarded to advanced graduate students for the purpose of supporting Ph.D. dissertation requirements. Candidates for the J.D. degree are also eligible for Humphrey Fellowships during their third year. Candidate qualifications and their Ph.D. dissertation or J.D. thesis topics must be approved by the selection committee. Ten rounds of competition have been held since the inception of the program in 1979 and a total of 52 awards have been made to date. Two fellows were selected for Humphrey Fellowships in 1987.

William C. Foster Fellows

In December 1983, the Arms Control and Disarmament Act was amended to

provide for the establishment of "a program for visiting scholars in the field of arms control and disarmament." The purpose of this program is "to give specialists in the physical sciences and other disciplines relevant to the Agency's activities an opportunity for active participation in the arms control and disarmament activities of the Agency and to gain, for the Agency, the perspective and expertise such persons can offer." The law states that the visiting scholars are to be chosen by a board chaired by the current Director and composed of all former directors of ACDA.

Six scholars were selected for its first program in 1984-85, five for 1985-86, one for 1986-87, and two for 1987-88. The scholars' assignments to ACDA were effected under the provisions of the Intergovernmental Personnel Act. In honor of the first director of ACDA, William C. Foster, who died on October 15, 1984, these visiting scholars are known as William C. Foster Fellows. Fellows selected for 1987-88 are:

Fellow & University	Bureau Assignments
Nancy O'Fallon, University of Chicago	Strategic Programs
Ludwig Bruch, University of Wisconsin	Verification and Intelligence

Planning began in the Fall of 1987 for the fifth year of the Program.

8 - PUBLICATIONS

ACDA is the key agency for preparing three statutorily-mandated reports, Arms Control Impact Statements (ACIS), Report on Soviet Noncompliance, and Adherence to and Compliance with Agreements. It also submits its statutorily-mandated Annual Report. In addition to those four reports, ACDA also prepares annually two other reports which, over the years, have become useful and popular reference documents, World Military Expenditures and Arms Transfers (WMEAT) and Documents on Disarmament. From time to time, ACDA publishes reports on specific arms control issues and updates the compendium, Arms Control and Disarmament Agreements. ACDA

began publishing during the year a new monthly publication, Arms Control Update, a newsletter containing current information on arms control issues.

Arms Control Impact Statements

ACIS contains details on certain weapons systems appearing in the Department of Defense and Department of Energy budget requests together with analyses on the impact such systems have on arms control agreements, treaties, and negotiations. Those weapon systems include nuclear weapon-related programs, defense programs which exceed specified cost ceilings, and other technology and weapons systems which the Executive Branch certifies as having significant effects on arms control.

The FY 1989 ACIS document will be submitted to the Congress before the end of January, 1988. In-depth arms control impact analyses on the following systems, grouped by Program Elements in specific clusters, were included in the FY 1989 Report: Strategic Defense Initiative, Strategic Offensive Systems, Space Defense, Chemical Weapons, and Atomic Vapor Laser Isotope Separation. All of these programs were considered consistent with US arms control policy and obligations and essential to US security interests.

Arms Control Compliance

ACDA is the lead agency in preparing the President's annual submission to Congress, Report on Soviet Noncompliance. The report presents in detail an evaluation of Soviet actions with respect to arms control obligations. The sixth Presidential report in this series was submitted in December 1987. ACDA prepares and the President submits to the Congress annually, Adherence to and Compliance with Agreements; this report contains details of the process by which the US Government ensures US compliance with its arms control obligations, detailed responses to Soviet charges of US noncompliance, and an evaluation of other nations' compliance essential with international arms control agreements.

ACDA Annual Report

Section 50 of the Arms Control and Disarmament Act requires that ACDA

send to the Congress by January 31 of each year a report concerning the activities of the Agency. The report is to include a complete and analytical statement of arms control and disarmament goals, negotiations, and activities and an appraisal of the status and prospects of arms control negotiations and of arms control measures in effect. This edition is the twenty-seventh report in the series.

World Military Expenditures and Arms Transfers

The annual publication, World Military Expenditures and Arms Transfers (WMEAT), provides a dimension to ACDA's responsibility to inform the public about global military expenditures. The 1986 WMEAT was published in May 1987 and the 1987 edition will be published in March 1988. Copies of all editions of WMEAT are circulated throughout the world.

WMEAT provides a compilation of worldwide military and other relevant statistics as well as essays on related topics. It contains data on military spending, armed forces, arms transfers, gross national product, central government expenditures, and population data for 145 countries. It is the most comprehensive source of this type of information available and is widely used by scholars, journalists, universities, government agencies, research institutions, and other interested parties.

The 1987 WMEAT will provide worldwide military and other relevant statistics for the period, 1978-1985, as well as arms transfer data through 1986. It will also contain essays on the arms trade in the Third World and on the new missile technology control regime.

Documents on Disarmament

The 1985 volume of ACDA's historical series, Documents on Disarmament, will be released in 1988. Each volume of the series, begun in 1960, documents significant arms control and disarmament undertakings through publication of treaties, agreements, laws, reports, statements, resolutions, communiques, proposals, declarations, and speeches of both US and foreign origin. Volumes are available to the public through the US Government Printing Office.

9 - ACDA ORGANIZATION

ACDA, organized under the Director, includes four bureaus and four offices. Each bureau, under the direction of an assistant director appointed by the President and confirmed by the Senate, is further broken down into divisions, each responsible for specific areas of ACDA's mandate. ACDA's authorized full-time equivalent personnel complement during the year reached 212, with an additional 57 positions approved for detailees from the Department of State and the Department of Defense.

Office of the Director

The Director and Deputy Director advise the President, the National Security Council, the Secretary of State, and other senior government officials on arms control and disarmament matters, and their relationship to other aspects of overall national security policy. The Director is responsible for all ACDA operations and activities. The Office of the Director provides policy guidance to all ACDA elements and includes the following distinct areas of responsibility:

The Counselor

The Counselor assists the Director and Deputy Director and serves as a principal adviser on all aspects of ACDA's operations and as a link between the Director and top decision makers within ACDA and in other agencies.

The Executive Secretary

The Executive Secretary directs and coordinates staff work for the Director, directs substantive issues and studies, and assists the Director in keeping policy, organizational, and functional aspects of arms control matters in phase.

The Special Representatives for Arms Control and Disarmament Negotiations

The Special Representatives for Arms Control and Disarmament Negotiations, appointed by the President with the advice and consent of the Senate and with the rank of Ambassador, advise the President and the

Secretary of State on international arms control negotiations and related matters.

The Office of Negotiations on Nuclear and Space Arms

The Office of Negotiations on Nuclear and Space Arms in Geneva was established by the State Department as a diplomatic mission for the expanded negotiations on defense and space weapons, strategic nuclear weapons, and intermediate-range nuclear weapons. Consistent with ACDA's statutory authority, ACDA manages the operation of these negotiations under the direction of the President and the Secretary of State. Personnel of this office are detailed by the State Department to ACDA on a reimbursable basis.

The US Representative to the Conference on Disarmament

The US Representative to the Conference on Disarmament (CD) with the rank of Ambassador leads the US delegation to the CD in Geneva, the UN Disarmament Commission, the United Nations General Assembly First Committee, and, as requested by the Director, also represents him in other negotiations having arms control significance.

The US Commissioner of the US/USSR Standing Consultative Commission

The US Commissioner of the US/USSR Standing Consultative Commission (SCC), under the direction of the President through the mechanism of the National Security Council, represents the United States in the SCC and heads the US Component of the Commission. He holds the rank of Ambassador. Administrative and logistical support for the SCC is provided by ACDA.

The Senior Military Advisor

The Senior Military Advisor provides high-level liaison with the Office of the Secretary of Defense and the Joint Chiefs of Staff in policy formulation, arms control negotiations, and ACDA operations.

The Executive Director of the General Advisory Committee

The Executive Director of the General Advisory Committee (GAC)

provides support for the GAC, including White House and Congressional liaison, in the GAC's exercise of broad statutory responsibilities as a Presidential advisory body on arms control and disarmament. (See Appendix VI.)

The Senior Policy Advisor

The Senior Policy Advisor provides the Director with assessments and other analyses that address longer-term issues relating to arms control and ACDA responsibilities.

Bureau of Strategic Programs

The Bureau of Strategic Programs (SP) is responsible, within ACDA, for US-Soviet nuclear arms control. SP, in coordination with other US agencies, develops US nuclear arms control policies for Presidential approval, supports negotiations on nuclear arms control and provides analytical support for these efforts. These efforts include support for the Nuclear and Space Talks in Geneva, and chairing the backstopping committees in Washington for these negotiations. In addition, SP organizes and provides backstopping for the twice-yearly meetings of the Standing Consultative Commission, as well as for the five-year review of the Anti-Ballistic Missile Treaty. ACDA provides primary administrative support for bilateral arms control.

The Director of ACDA is advised by SP on all matters related to strategic arms control, including the above negotiations, the Strategic Defense Initiative, and arms control compliance. SP chairs the Defense and Space Interagency Group and is a member of various other administration interagency groups related to strategic arms control.

SP is responsible for consultation and coordination with allied and other foreign governments on US/Soviet arms control negotiations. The Bureau integrates allied and other foreign government views into analyses and planning for negotiating positions, and maintains the official record of all relevant documents, speeches, significant comments, and general material related to bilateral arms control and negotiations. SP

coordinates with other agencies on research and policy studies to support the development of a comprehensive and effective arms control program. The Bureau also conducts external research on the technical and political implications of current and proposed negotiating options. This research supports implementation of existing agreements, ongoing negotiations, and planning for future negotiations. The Bureau of Strategic Programs is comprised of three divisions: the Strategic Affairs Division, the Theater Affairs Division and the Defense and Space Division.

Bureau of Multilateral Affairs

The Multilateral Affairs (MA) Bureau develops for Presidential approval arms control policy, strategy, and tactics for ongoing multilateral arms control negotiations, and provides organizational support, delegation staffing, and Washington backstopping for multilateral negotiations.

Specifically, the Multilateral Affairs Bureau takes the lead within the US Government for the preparation of guidance for, and the backstopping of, US delegations to the Conference on Disarmament (CD), multilateral and bilateral chemical weapons negotiations, the United Nations Disarmament Commission (UNDC), and the First Committee of the United Nations General Assembly, and provides general support to Ambassador Friedersdorf who heads these delegations. MA provides much of the staffing for these delegations. MA also assists in the preparation of guidance for all conventional arms control negotiations, to include the Mutual and Balanced Force Reductions (MBFR), Conference on Confidence- and Security-Building Measures and Disarmament in Europe (CDE), and the East-West mandate discussions for future conventional stability negotiations in Europe, and for bilateral US-Soviet negotiations on nuclear testing. MA also provides staffing for each of these delegations. In addition, in 1987, the MA Bureau assumed a leadership role for the coordination and oversight of implementation of the Stockholm CDE Document by the United States and by the other participating states.

The Bureau has responsibility for advising and briefing the Director

and Deputy Director for their meetings with foreign country representatives on multilateral issues.

The Bureau has two divisions: International Security Policy (ISP) and Science and Technology Policy (STP). The two divisions are staffed with foreign affairs specialists (both Foreign Service and Civil Service), military officers and physical scientists, and provide ACDA's support to multilateral negotiations. The ISP Division Chief is responsible for backstopping the CD, the UNGA, the UNDC, the CDE, security aspects of the Conference for Security and Cooperation in Europe (CSCE), as well as the MBFR talks and the East-West conventional stability mandate talks. The STP Division Chief is responsible for backstopping negotiations and discussions on chemical weapons, biological weapons and nuclear testing.

Bureau of Verification and Intelligence

The Bureau of Verification and Intelligence is responsible for policies and studies dealing with the verifiability of provisions of current and projected arms control agreements.

The Bureau is divided into three divisions: the Verification Division which deals with verification and compliance issues, the Operations Analysis Division which performs analytical studies and provides computer support, and the Intelligence Division which performs intelligence studies and provides ACDA with necessary intelligence information.

The bureau plans, organizes and supervises studies and policy papers prepared within the agency and reviews those prepared by other organizations dealing with the verifiability of provisions of current and projected arms control agreements; provides for the Director's use the assessments of verifiability and other information called for in the Arms Control and Disarmament Act (as amended); prepares analysis of information pertaining to compliance by other states with existing arms control agreements to which the United States is a party; makes assessments of possible new systems, devices, and capabilities for verification; conducts liaison with intelligence and scientific agencies concerned with systems,

techniques, and instruments useful for verification; makes arrangements for and participates in discussions of US and international bodies involved in the verification of and compliance with arms control agreements; and provides intelligence information pertinent to the planning for arms control discussions, the conduct of negotiations, and the assessment of compliance.

Given the critical importance of verification and compliance in November 1982, the President established a high-level committee for oversight of compliance with existing arms control agreements and for assuring the verifiability of agreements being negotiated. The Assistant Director for Verification and Intelligence is a member of the Arms Control Verification Committee (chaired by the Assistant to the President for National Security Affairs) and Co-Chairman of the Analysis Group under this committee. This analysis group has been responsible for the preparation and interagency coordination of five Presidential Compliance Reports.

The Bureau is also responsible for liaison action with the intelligence community including storing and controlling the handling of all documents that contain special intelligence material, assisting Agency personnel in obtaining the necessary access to sensitive compartmented information, and disseminating and enforcing all regulations that pertain to discussions, visits, and other exchanges of information that involve special intelligence data.

The Bureau also provides operation and analysis and computer support for all ACDA activities. (See Chapter 7)

Bureau of Nuclear and Weapons Control

The Bureau of Nuclear and Weapons Control, organized into four divisions, carries out ACDA activities on nuclear nonproliferation issues, international safeguards, arms and technology transfers, arms control impact studies, defense economics and economics of arms control, military expenditure recording and analysis, and weapons analyses.

The International Nuclear Affairs Division provides advice, assessments, and policy recommendations on the international relations aspects of nonproliferation including the following areas: the Treaty on the Non-Proliferation of Nuclear Weapons; the Treaty of Tlatelolco (Latin American Nuclear Weapons Free Zone); policy issues at the International Atomic Energy Agency (IAEA); cooperation among nuclear supplier countries, especially multilateral export controls; "sensitive" country issues (e.g., Pakistan); and US agreements for civil nuclear cooperation. The INA Division is also responsible for preparing the unclassified Nuclear Proliferation Assessment Statement that is required by law for each proposed agreement for peaceful cooperation, and for providing ACDA views on US nuclear export control issues.

The Nuclear Safeguards and Technology Division provides advice and policy recommendations on the IAEA safeguards system, nuclear fuel cycles, and the technology aspects of nonproliferation. Staffed by physical science officers, this Division develops safeguards concepts, monitors and seeks to strengthen the IAEA safeguards system, holds bilateral consultations on these matters with experts abroad, participates in guiding the US Program of Technical Assistance for IAEA Safeguards and recruiting/training of US nationals for service at the IAEA, and makes recommendations on new safeguards agreements. Further, the Division monitors and helps guide the IAEA's program of technical assistance, assesses the safeguards and nonproliferation implications of emerging technologies, assists in implementation of nonproliferation initiatives such as spent fuel storage, and directs the US program on Reduced Enrichment for Research and Test Reactors.

The Arms Transfer Division assesses the arms control implications of proposed arms transfers and technology transfers; represents ACDA in the preparation of the Administration's annual security assistance programs; and participates in the implementation of the Missile Technology Control Regime.

The Defense Programs and Analysis Division is responsible for the annual set of Arms Control Impact Statements (ACIS); the Agency's economic analysis of defense and arms control programs; the analysis of weapons technology; the publication of the ACDA Annual Report and World Military Expenditures and Arms Transfers; and the inspection provisions of the Antarctic Treaty.

Office of General Counsel

This office is responsible for all matters of domestic and international law relevant to ACDA's work. It provides advice and assistance in drafting and negotiating arms control treaties and agreements, and on questions regarding their approval by Congress, implementation, interpretation, ratification, and revision. Lawyers from the office serve as legal advisers on US-Soviet negotiating delegations (i.e. INF, START, and nuclear testing talks). The General Counsel is the legal adviser to Ambassador Kampelman as head of the Nuclear and Space Talks delegation in Geneva. Office lawyers also serve on multilateral negotiating delegations, at conferences reviewing past arms control agreements, and at sessions of the Standing Consultative Commission.

The office is responsible for legal matters relating to arms control policy formulation and ACDA legislation programs, including drafting such legislation. it performs liaison as required with the Legislative Reference Division and the Office of Management and Budget. ACDA lawyers, as officers of the American Bar Association's Committee on Arms Control, of which the General Counsel is chairman, serve as liaison with that Association. The Office also handles the legal aspects of Agency policies and operations in the areas of personnel, ethics, security, patents, contracts, procurement, fiscal, and administrative matters.

Office of Public Affairs

The Office of Public Affairs (PA) is charged with disseminating information on arms control and disarmament to the public, one of the four major tasks assigned to ACDA by law.

To this end the Public Affairs Office carries out three functions. In its "spokesman role", PA works to ensure that the media and other priority audiences have an accurate and complete understanding of US arms control policies. Second, the office engages in an outreach program to make the public aware of arms control activities through speaking engagements by ACDA officials and through publishing a monthly newsletter and a variety of other materials. The office also responds to thousands of information requests annually. Finally, the Office provides the Director and senior Agency officers with advice on public perceptions of US Government arms control policies.

The Speakers Program is among PA's most prominent activities to disseminate information on arms control to the public. The Director made over 65 public appearances in 1987 before audiences throughout the world. Fifty-nine other ACDA officers were similarly involved in the program, making over 225 appearances at symposia, debates or other meetings focusing on arms control matters.

Most talks were delivered to civic groups, college and secondary school audiences. Other speaking engagements involved world affairs councils, United States Information Agency (USIA) sponsored programs, and church groups. See Appendix IV for a list of 1987 public appearances by ACDA officers.

PA represents ACDA on the NSC-chaired Public Diplomacy Interagency Group. This group is responsible for preparing, coordinating, and publishing materials to support the Administration's conduct of public diplomacy activities. ACDA also provides guidance on arms control matters to press spokesmen of other Federal agencies, assists the USIA in preparation of information for use abroad, conducts special programs and conferences for nongovernmental organizations and the news media, and conducts briefings for media representatives, visiting students, and scholars.

PA publishes and distributes daily "ACDA News," a compilation of daily press clippings. This service enjoys nationwide circulation and is prized

by researchers as well as media and private citizens as a valuable, comprehensive reference source.

PA began publishing during the year a new monthly newsletter, Arms Control Update, which is distributed domestically and overseas to officials, the media, teachers, and private citizens. A convenient and reliable source of up-to-date information, the newsletter covers all aspects of administration arms control activities. In addition, PA dispatches a daily cable containing selected press releases on arms control to US Diplomatic posts overseas. PA also supplies numerous updates of arms control topics in its Issues Brief series.

The ACDA Historian, a member of the PA staff, publishes the annual Documents on Disarmament, which contains a compilation of arms control documents, communiques, and speeches of both US and foreign origin. PA also provides audio-visual and photographic services for ACDA and manages an arms control reference library which maintains for circulation and reference a collection of books, periodicals, documents, and reference material on arms control and related subjects.

Office of Congressional Affairs

The Office of Congressional Affairs (OCA) responds to the Congressional interest in arms control and the Geneva negotiations by arranging briefings and consultations as well as individual meetings between ACDA officials and Members of Congress and staff. OCA has arranged many arms control seminars for Congressional staff with ACDA officials and frequently with officials from other agencies and departments as well. OCA also works with Congressional committee staffs in arranging hearings at which ACDA officials appear as witnesses. In addition, OCA routinely distributes informational material on arms control issues to Members of Congress and their staffs.

Office of Administration

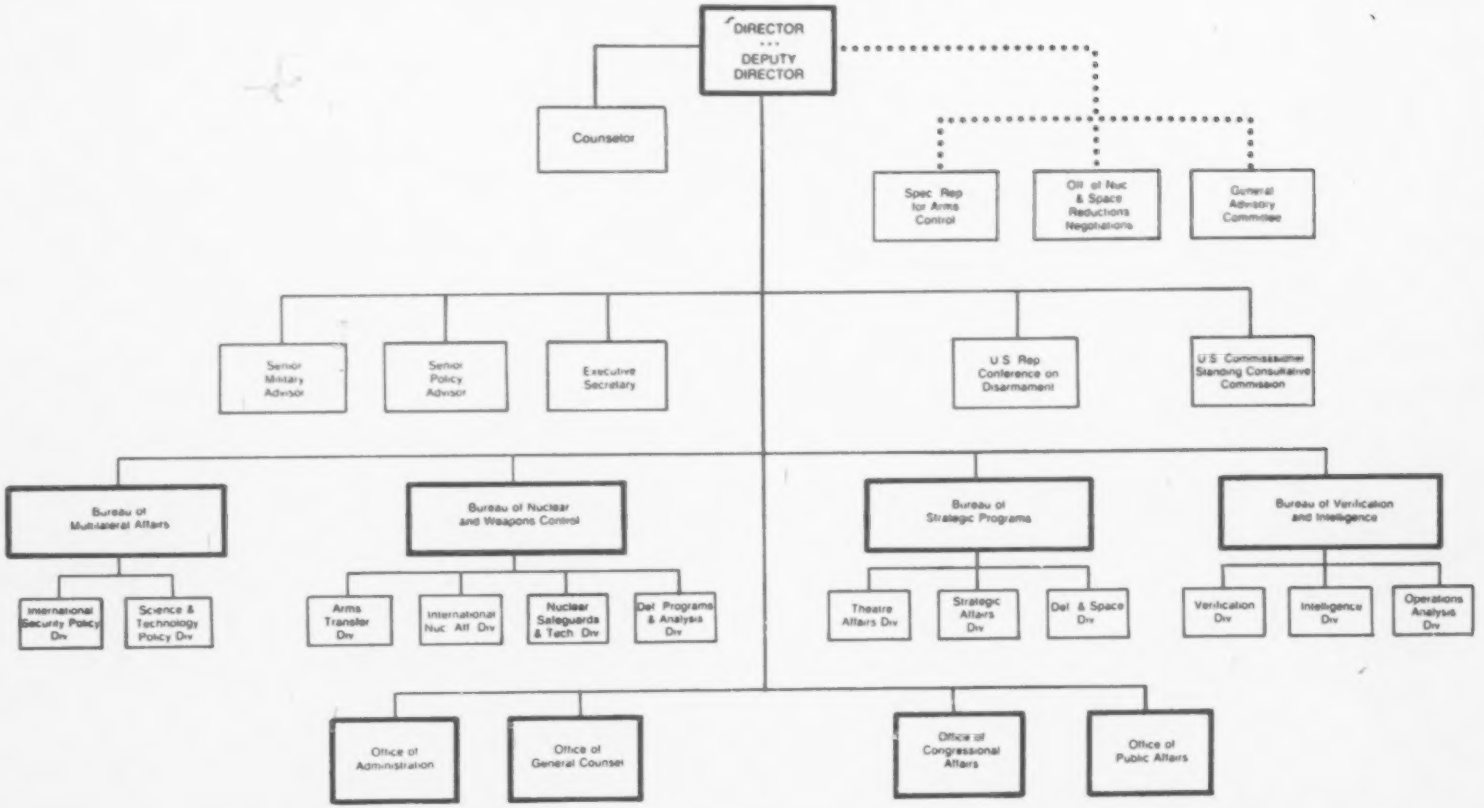
The Office of Administration has responsibility for ACDA's administrative management and for providing support to all of its components, including its negotiating staffs in Geneva and Vienna.

Management duties include the administration of all personnel, budget, fiscal, supply, security, communications, research contracts, and administrative support. On important security issues, the Director of Security has direct access to the Director and the Deputy Director. The office maintains close liaison with the Department of State, the General Services Administration, and other organizations providing services on behalf of ACDA.

OFFICIALS OF ACDA
(As of December 31, 1987)

DIRECTOR	Vacant
DEPUTY DIRECTOR	David F. Emery
COUNSELOR	Michael A. Guhin
EXECUTIVE SECRETARY	William B. Staples
US REPRESENTATIVE TO THE CONFERENCE ON DISARMAMENT	Max L. Friedersdorf
US COMMISSIONER, STANDING CONSULTATIVE COMMISSION	Richard H. Ellis
SENIOR MILITARY ADVISOR	BGen Jay W. Kelley, USAF
EXECUTIVE DIRECTOR, GENERAL ADVISORY COMMITTEE	Vacant
SENIOR POLICY ADVISOR TO THE DIRECTOR	Charles Sorrels
ASSISTANT DIRECTOR FOR MULTILATERAL AFFAIRS	Lynn M. Hansen
ASSISTANT DIRECTOR FOR NUCLEAR AND WEAPONS CONTROL	Kathleen C. Bailey
ASSISTANT DIRECTOR FOR STRATEGIC PROGRAMS	Vacant
ASSISTANT DIRECTOR FOR VERIFICATION AND INTELLIGENCE	Manfred Eimer
GENERAL COUNSEL	Thomas Graham, Jr.
DIRECTOR OF PUBLIC AFFAIRS	Sigmund Cohen
DIRECTOR OF CONGRESSIONAL AFFAIRS	William S. Shepard
ADMINISTRATIVE DIRECTOR	William J. Montgomery

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY



Appendix I

1987 ARMS CONTROL CHRONOLOGY

Jan 12-30	Intersessional meeting of Conference on Disarmament (CD) ad hoc committee on chemical weapons.
Jan 13	Round I, Nuclear Risk Reduction Centers negotiations.
Jan 15	Round VII of the Nuclear and Space Talks (NST) begins in Geneva.
Jan. 22 Feb. 9	Round IV of Nuclear Testing Experts Meeting.
Jan 27	Conference on Security and Cooperation in Europe (CSCE) Review Conference resumes in Vienna.
Jan 29-30	Western industrialized countries hold informal discussions on efforts to curb the supply of chemical weapons precursors which could be used to produce chemical weapons for use in Gulf War.
Jan 29	Round 41 of the Mutual and Balanced Force Reductions (MBFR) talks begins in Vienna.
Feb 2	CD winter session begins in Geneva.
Feb 4-5	US-Canada nonproliferation bilaterals.
Feb 5	ACDA Director Adelman addresses CD reaffirming US commitment to global verifiable ban on chemical weapons.
Feb 8	Conventional on the Physical Protection of Nuclear Material enters into force.
Feb 16 Mar 5	US-USSR bilateral session on chemical weapons in Geneva.
Feb 17	First meeting of NATO-Warsaw Pact "Group of 23" to discuss mandate for future negotiations on conventional stability in Europe, in Vienna.
Feb 24	Prime Minister Gonzales annnounces in a speech to the Spanish Cortes (Parliament) that Spain will join the NPT.
Mar 2-13	Group of Scientific Experts meet in Geneva.
Mar 4	United States tables draft INF Treaty based on the Reykjavik agreements in Geneva.
Mar 6	Strategic Arms Reduction Talks (START) and Defense & Space (DST) Negotiating Groups conclude Round VII of NST; Round VII extended for INF Negotiating Group.
Mar 16-20	Round Five of Nuclear Testing Experts Meeting in Geneva.
Mar 18	Standing Consultative Commission (SCC) Session XXXIII begins in Geneva.
Mar 19	MBFR recesses.
Mar 23- Apr 10	UN Conference for the Promotion of International. Cooperation in The Peaceful Uses of Nuclear Energy.

Mar 26	INF Negotiating Group concludes Round VII.
Mar 31	Ad hoc meeting of scientific and technical experts Apr 15 from states parties to the Biological and Toxin Weapons Convention in Geneva.
Apr 6	NATO-Warsaw Pact mandate talks recess.
Apr 7	CSCE Review Conference recesses
Apr 13-15	Secretary of State Shultz and Soviet Foreign Minister Shevardnadze meet in Moscow along with NST arms control experts.
Apr 16	President Reagan announces a Missile Technology Control Regime under which the United States, Canada, France, The Federal Republic of Germany, Italy, Japan, and The United Kingdom have adopted in common a new policy to limit the proliferation of nuclear-capable missiles.
Apr 23	US reaffirms invitation to Soviet Union to visit CW destruction facility at Tooele.
Apr 23	INF Negotiating Group begins Round VIII in Geneva.
Apr 27	SCC Session XXXIII concludes in Geneva.
Apr 27	USSR tables draft INF Treaty in Geneva.
Apr 27-30	Tenth General Conference of the Organization for the Prohibition of Nuclear Weapons in Latin America (OPANAL).
Apr 30	CD Winter Session recesses.
May 3-4	Round II Nuclear Risk Reduction Centers negotiations
May 4-29	UN Disarmament Commission (UNDC) meets in New York.
May 5	CSCE Review Conference resumes in Vienna.
May 5	START and DST Negotiating Groups begin Round VIII in Geneva; US tables draft START Treaty.
May 11	NATO-Warsaw Pact mandate talks resume in Vienna.
May 14	Round 42 of MBFR talks begins in Vienna.
May 18	Round Five of Nuclear Testing Experts Meeting resumes in Geneva.
June 8	CD Summer Session opens in Geneva.
June 12	NATO Ministerial in Reykjavik issues statement on conventional arms control, calling for two distinct negotiations, one on confidence-building measures as follow-up to Stockholm CDE, and the second on NATO-Warsaw Pact conventional stability talks.
July 2	Round 42 of MBFR ends.
July 6-7	Meeting of chemical industry experts on margins of CD in Geneva to discuss industry-related aspects of CW negotiations.

July 10 — Western states table draft mandate for Stockholm CDE follow-on meeting at CSCE Review Conference.

July 13-20 — Round Six of Nuclear Testing Experts Meeting in Geneva.

July 20 Aug 7 — US-Soviet bilateral session on chemical weapons in Geneva.

July 27-30 — Ninth round of US-USSR nonproliferation consultations held in Moscow.

July 22 — Gorbachev announces agreement to INF "zero option".

July 27 — Western states table draft mandate for conventional stability negotiations in Vienna; East-West mandate talks recess.

July 27 Aug. 7 — Group of Scientific Experts meet again in Geneva.

July 29 — USSR tables draft DST agreement in Geneva.

July 31 — CSCE Review Conference recesses.

July 31 — USSR tables draft START Treaty in Geneva.

Aug 6 — Soviet Foreign Minister Shevardnadze addresses CD, accepting principle of mandatory challenge inspection without right of refusal; invites CD delegations to Shikhany military facility; promises future invitation to CW destruction facility under construction near Chapayevsk.

Aug 28-30 — US conducts first on-site inspection of Soviet military activity near Minsk in Byelorussian Military District, under terms of Stockholm CDE accord.

Aug 28 — CD summer session ends.

Sep 8-9 — US-Chinese arms control bilaterals in Washington.

Sep 10-12 — UK conducts inspection of Soviet/GDR military activity near Cottbus under terms of Stockholm CDE Document.

Sep 14 — US tables INF Treaty based on double global zero.

Sep 14-15 — Western industrialized countries hold additional informal discussions in efforts to curb the supply of chemical weapon precursors which could be used to produce CW for use in the Gulf War.

Sep 15-17 — US-USSR Ministerials in Washington; Secretary of State Shultz and Soviet Foreign Minister Shevardnadze resolve some NST issues; issue joint statement announcing full-scale negotiations on nuclear testing.

Sep 16 — (SCC) Session XXXIV begins in Geneva.

Sep 17 — Nuclear Risk Reduction Centers Agreement signed in Washington.

Sep 21-25 — 31st Annual General Conference of the International Atomic Energy Agency (IAEA) is held in Vienna.

Sept 21 — Session 42 of United Nations General Assembly (UNGA) opens in New York; President Reagan addresses Assembly.

Sep 22	South Africa announces it is prepared to commence negotiations on the possibility of signing the NPT.
Sep 22	CSCE Review Conference resumes in Vienna.
Sep 24	Round 43 of MBFR talks in Vienna.
Sep 28	NATO-Warsaw Pact mandate talks resume in Vienna.
Oct 3-4	US and other CD delegations visit Soviet chemical weapons facility at Shikhany to view munitions and a mobile destruction unit.
Oct 5-6	Soviets conduct their first inspection under terms of Stockholm CDE Document of a US amphibious landing in Turkey.
Oct 7-8	Round Three of US-Soviet bilateral discussions on ways to prevent proliferation of chemical weapons in Bern, Switzerland.
Oct 12 Nov 16	First Committee of UNGA addresses arms control and disarmament issues.
Oct 16	President Reagan certifies to Congress that certain conditions placed on the final assembly of binary chemical munitions have been met.
Oct 21-22	Secretary of State Shultz and Soviet Foreign Minister Shevardnadze meet in Moscow to resolve remaining INF differences.
Oct 26-30	US hosts technical workshop for Group of Scientific Experts.
Oct 27-28	US-Canada nonproliferation bilateral discussions.
Oct 28-30	Soviet Union conducts second inspection under Stockholm CDE of a US military activity in the Federal Republic of Germany.
Oct 30	Secretary Shultz and Soviet Foreign Minister Shevardnadze meet in Washington and agree to a December 7 summit date.
Nov 5	Spain deposits its instrument of accession to the NPT in Washington, London, and Moscow.
Nov 5	SCC session XXXIV ends in Geneva.
Nov 9-20	US-USSR first session of full-scale negotiations on nuclear testing held in Geneva.
Nov 11-13	GDR conducts its first inspection under terms of Stockholm CDE Document of a German/US military activity in the Federal Republic of Germany.
Nov 19-20	Soviet delegation visits Tooele Army Depot, Utah, to see US chemical munitions and a demonstration of CW destruction technology.
Nov 23-24	Secretary Shultz and Foreign Minister Shevardvadze meet in Geneva.
Nov 30- Dec 16	Intersessional discussions on chemical weapons at the CD in Geneva.

Nov 30 Dec 18	US-Soviet bilateral discussion on chemical weapons in Geneva.
Dec 3	MBFR Round 43 recesses.
Dec 7	Round VIII NST ends.
Dec 7-10	President Reagan and Soviet General Secretary Gorbachev hold summit meeting in Washington.
Dec 8	President Reagan and General Secretary Gorbachev sign INF Treaty
Dec 9	Secretary Shultz and Foreign Minister Shevardvadze announce exchange of "familiarization visits" to nuclear test sites in January 1988.
Dec 9	NATO Ministerial in Brussels.
Dec 8-9	US-UK nonproliferation bilaterals.
Dec 14	Conventional stability mandate talks recess.
Dec 18	CSCE Review Conference recesses.
Dec 20	US delegation visits Gomel and Moscow following US charge of Soviet ABM violation.
Dec 21	UNGA session ends.

Appendix II

BILATERAL ARMS CONTROL RELATED AGREEMENTS CONCLUDED BETWEEN THE UNITED STATES AND THE SOVIET UNION June 1963 - December 1987

	Entered Into Force	Signed
"Hot Line" Agreement	6/20/63	6/20/63
"Hot Line" Improvement and Modernization Agreement	9/30/71	9/30/71
Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War	9/30/71	9/30/71
Agreement on Prevention of Incidents On and Over the High Seas	5/25/72	5/25/72
ABM Treaty	5/26/72	10/3/72
Interim Agreement on the Limitation of Strategic Offensive Arms	5/26/72	10/3/72*
Memorandum of Understanding Regarding Establishment of a Standing Consultative Commission	12/21/72	12/21/72

* Expired by its terms on October 3, 1977

Protocol to the Agreement of May 25, 1972, on Prevention of Incidents On and Over the High Seas	5/22/73	5/22/73
Agreement on Prevention of Nuclear War	6/22/73	6/22/73
Protocol to the ABM Treaty	7/3/74	5/24/76
Threshold Test Ban Treaty	7/3/74	
Treaty on the Limitation of Underground Nuclear Explosions for Peaceful Purposes	5/28/76	
Treaty on the Limitation of Strategic Offensive Arms	6/18/79**	
Agreement for Improving 1963 and 1971 Direct Communication Link ("Hot Line")	7/17/84	7/17/84
Treaty on the Elimination of Intermediate-Range and Shorter-Range Nuclear Missiles	12/8/87	

**If the Treaty had entered into force, it would have expired by its terms on December 31, 1985.

Appendix III

STATUS OF MULTILATERAL ARMS CONTROL AGREEMENTS

as of December 1987

	Antarctic Treaty	Limited Test Ban Treaty	Outer Space Treaty	Latin America Nuclear free Zone	Nuclear Non-Proliferation Treaty	Seabed Arms Control Treaty	Geneva Protocol	Biological Weapons Convention	Environmental Modification Convention
Agreement Opened for Signature	12/1/59	8/5/63	1/27/67	2/14/67	7/1/68	2/11/71	6/17/25	4/10/72	5/18/77
Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Afghanistan		P	S		P	P	P	P	P
Algeria		S							
Antigua & Barbuda			P (1)	P	P	P (1)	P (1)		P (1)
Argentina	P	P	P	S		P	P	P	P
Australia	P	P	P		P	P	P	P	P
Austria	P	P	P		P	P	P	P	
The Bahamas		P	P	P	P		P (1)	P	
Bangladesh		P	P		P			P	P
Barbados			P	P	P		P	P	
Belgium	P	P	P		P	P	P	P	P
Belize					P		P (1)	P	
Benin		P	P		P	P	P	P	P
Bhutan		P			P		P	P	
Bolivia		P	S	P	P	S	P	P	S
Botswana		P	S		P	P	P (1)	S	
Brazil	P	P	P	S (2)		S	P	P	P
Brunei			P (1)		P	P (1)		P (1)	P (1)
Bulgaria	P	P	P		P	P	P	P	P
Burkina		S	P		P		P		
Burma		P	P			S	P	S	
Burundi		S	S		P	S		S	

P - Party
S - Signatory

	Antarctic Treaty	Limited Test Ban Treaty	Outer Space Treaty	Latin America Nuclear Free Zone	Nuclear Non-Proliferation Treaty	Seabed Arms Control Treaty	Geneva Protocol	Biological Weapons Convention	Environmental Modification Convention
Agreement Opened for Signature	12/1/59	8/5/63	1/27/67	2/14/67	7/1/68	2/11/71	6/17/25	4/10/72	5/18/77
Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Byelorussian SSR		P	P			P		P	P
Cambodia					P		P	P	
Cameroon		S	S		P	S			
Canada		P	P		P	P	P	P	P
Cape Verde		P			P	P		P	P
Central African Republic		P	S		P	P	P	S	
Chad		P			P				
Chile	P	P	P	S (2)			P	S	
China	P		P	P (3)			P	P	
Colombia		P	S	P	P	S		P	
Congo (Brazzaville)					P	P		P	
Costa Rica		P		P	P	S		P	
Cuba	P		P			P	P	P	P
Cyprus		P	P		P	P	P	P	P
Czechoslovakia	P	P	P		P	P	P	P	P
Denmark	P	P	P		P	P	P	P	P
Dominica			P (1)		P	P (1)	P (1)	P (1)	P (1)
Dominican Republic		P	P	P	P	P	P	P	

P - Party
S - Signatory

	Antarctic Treaty	Limited Test Ban Treaty	Outer Space Treaty	Latin America Nuclear Free Zone	Nuclear Non-Proliferation Treaty	Seabed Arms Control Treaty	Geneva Protocol	Biological Weapons Convention	Environmental Modification Convention
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Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Ecuador	P	P	P	P	P		P	P	
Egypt		P	P		P		P	S	P
El Salvador		P	P	P	P		S	S	
Equatorial Guinea					P	S			
Estonia							P		
Ethiopia		S	S		P	P	P	P	S
Fiji		P	P		P		P	P	
Finland	P	P	P		P	P	P	P	P
France	P		P	P(3)S(4)			P	P	
Gabon		P			P			S	
Gambia		P	S		P	S	P	S	
German Democratic Republic	P	P	P		P	P	P	P	P
Germany, Federal Republic of	P	P	P		P	P	P	P	P
Ghana		P	S		P	P	P	P	P
Greece	P	P	P		P	P	P	P	P
Grenada			P (1)	P	P	P (1)	P (1)	P	
Guatemala		P		P	P	S		P	
Guinea					P	S			
Guinea-Bissau			P		P	P		P	

P - Party
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Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Guyana			S				P (1)	S	
Haiti		S	S	P	P			S	
Holy See			S		P		P		S
Honduras		P	S	P	P	S		P	
Hungary	P	P	P		P	P	P	P	P
Iceland		P	P		P	P	P	P	S
India	P	P	P			P	P	P	P
Indonesia		P	S		P		P	S	
Iran		P	S		P	P	P	P	S
Iraq		P	P		P	P	P	S	S
Ireland		P	P		P	P	P	P	P
Israel		P	P				P		
Italy	P	P	P		P	P	P	P	P
Ivory Coast		P			P	P	P	S	
Jamaica		S	P	P	P	P	P	P	
Japan	P	P	P		P	P	P	P	P
Jordan		P	S		P	P	P	P	
Kenya		P	P		P		P	P	
Kiribati					P		P (1)		
Korea	P	P	P		P	P		P	P
Korea, (Dem. Peo.Rp.)	P				P			P	P

P - Party
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	Antarctic Treaty	Limited Test Ban Treaty	Outer Space Treaty	Latin America Nuclear Free Zone	Nuclear Non-Proliferation Treaty	Seabed Arms Control Treaty	Geneva Protocol	Biological Weapons Convention	Environmental Modification Convention
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Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Kuwait		P	P		S		P	P	P
Laos		P	P		P	P		P	P
Lativa							P		
Lebanon		P	P		P	S	P	P	S
Lesotho			S		P	P	P	S	
Liberia		P			P	S	P	S	S
Libya		P	P		P		P	P	
Liechtenstein					P				
Lithuania							P		
Luxembourg		P	S		P	P	P	P	S
Madagascar		P	P		P	S	P	S	
Malawi		P			P		P	S	P
Malaysia		P	S		P	P	P	S	
Maldives					P		P		
Mali		S	P		P	S	P	S	
Malta		P			P	P	P	P	
Mauritania		P							
Mauritius		P	P		P	P	P	P	
Mexico		P	P	P	P	P	P	P	
Monaco							P		
Mongolia		P	P		P	P	P	P	P
Morocco		P	P		P	P	P	S	S
Nauru					P				
Nepal		P	P		P	P	P	S	

P - Party
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Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Netherlands	P	P	P	P (4)	P	P	P	P	P
New Zealand	P	P	P		P	P	P	P	P
Nicaragua		P	S	P	P	P	S	P	S
Niger		P	P			P	P	P	
Nigeria		P	P		P		P	P	
Norway	P	P	P		P	P	P	P	P
Pakistan		S	P				P	P	P
Panama		P	S	P	P	P	P	P	
Papua New Guinea	P	P	P		P		P	P	P
Paraguay		S		P	P	S	P	P	
Peru	P	P	P	P	P		P	P	
Philippines		P	S		P		P	P	
Poland	P	P	P		P	P	P	P	P
Portugal		S			P	P	P	P	S
Qatar						P	P	P	
Romania	P	P	P		P	P	P	P	P
Rwanda		P	S		P	P	P	P	
St. Christopher-Nevis			P (1)		P (1)	P (1)	P (1)		P (1)
Saint Lucia			P (1)		P	P (1)	P (1)	P	P (1)
St. Vincent & the Grenadines					P	P (1)	P (1)		P (1)

P - Party
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COUNTRY									
San Marino		P	P		P			P	
Sao Tome & Principe					P	P		P	P
Saudi Arabia			P			P	P	P	
Senegal		P			P	S		P	
Seychelles		P	P		P	P	P (1)	P	
Sierra Leone		P	P		P	S	P	P	S
Singapore		P	P		P	P	P (1)	P	
Solomon Islands			P (1)		P	P (1)	P (1)	P (1)	P
Somalia		S	S		P			S	
South Africa	P	P	P			P	P	P	
Spain	P	P	P		P	P	P	P	P
Sri Lanka		P	P		P		P	P	P
Sudan		P			P	S	P		
Suriname				P	P		P (1)		
Swaziland		P	P (1)		P	P	P (1)		
Sweden	P	P	P		P	P	P	P	P
Switzerland		P	P		P	P	P	P	
Syrian Arab Republic		P	P		P		P	S	S
Tanzania		P				S	P	S	
Thailand		P	P		P		P	P	
Togo		P	S		P	P	P	P	

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COUNTRY									
Tonga		P	P		P		P	P	
Trinidad & Tobago		P	S	P	P		P		
Tunisia		P	P		P	P	P	P	P
Turkey		P	P		P	P	P	P	S
Tuvalu					P		P (1)		
Uganda		P	P		P		P		S
Ukrainian SSR		P	P			P		P	P
USSR	P	P	P	P (3)	P	P	P	P	P
United Arab Emirates								S	
United Kingdom	P	P	P	P(3)(4)	P	P	P	P	P
United States	P	P	P	P(3)(4)	P	P	P	P	P
Uruguay	P	P	P	P	P	S	P	P	
Venezuela		P	P	P	P		P	P	
Viet Nam, Socialist Republic of			P		P	P	P	P	P
Western Samoa		P			P				
Yemen (Aden)		P	P		P	P	P	P	P
Yemen (Sana)		S			P	S	P	S	P
Yugoslavia		P	S		P	P	P	P	

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Agreement Entered into Force	6/23/61	10/10/63	10/10/67	4/22/68	3/5/70	5/18/72	2/8/28	3/26/75	10/5/78
COUNTRY									
Zaire		P	S		P			P	S
Zambia		P	P			P	P (1)		
Zimbabwe							P (1)		
Taiwan (5)		P	P		P	P	P	P	
TOTALS*	37P	115P 13S	97P 29S	29P 3S	138P 1S	87P 23S	132P 2S	110P 27S	58P 17S

P - Party
S - Signatory

*Includes parties that have generally succeeded to treaty obligations.

Footnotes

(1) Based on general declarations concerning treaty obligations applicable prior to independence.

(2) Also ratified subject to preconditions not yet met.

(3) Additional Protocol II

(4) Additional Protocol I

(5) Instruments of ratification/adherence to these treaties have been deposited in the name of the Republic of China. Effective January 1, 1979, the United States recognized the Government of the People's Republic of China as the sole legal government of China.

Appendix IV

PUBLIC AFFAIRS APPEARANCES BY ACDA OFFICIALS IN 1987

Public Appearances by The Director

Academic Fora

Apr 23 - Georgetown University, Washington, DC
Apr 28 - Brandeis University, Waltham, MA
Jul 13 - JFK School of Government Alumni, Washington, DC
Jul 30 - American Federation of Teachers, Washington, DC
Oct 19 - Georgetown Leadership Seminar, Georgetown University, Washington, DC

Foreign Affairs Organizations

Jan.22 - Business Council on Foreign Relations, Chicago, IL
Jan 22 - National Strategy Forum, Chicago, IL
Jan 28 - Foreign Policy Association, New York, NY
Jan 30 - Wehrkunde Conference, Munich, FRG
May 1 - Mid-Atlantic Club, Harriman, NY
May 18 - CIA Retirees Association, Ft. Myer, VA
May 21 - American Defense Preparedness Association, Washington, DC
Jun 11 - North Atlantic Assembly, Washington, DC
Jun 19 - World Affairs Council, Washington, DC
Sept 28 - Detroit Committee on Foreign Relations, Detroit, MI
Oct 13 - World Affairs Council of Inland Southern California, Riverside, CA
Oct 14 - World Affairs Council, Los Angeles, CA
Oct 14 - World Affairs Council of Orange County, Santa Ana, CA

Research Institutes

Apr 28 - Institute for Foreign Policy Analysis, Inc., Boston, MA
May 18 - Center for Strategic Studies, Washington, DC
Oct 9-10 - Institute for Foreign Policy Analysis, Inc., & Netherlands Atlantic Commission, The Hague, NL

Major Media Events

Apr 22 - National Press Club, Washington, DC
Jun 16-17 - Aspen-ACDA Seminar for Journalists, Wye Plantation, MD
Aug 7 - Reader's Digest Seminar, New York, NY
Sept 10 - Foreign Press Center, Washington, DC
Sept 14 - Sperling Breakfast, Washington, DC

Other

Jan 22 - Chicago Bar Association, Chicago, IL
Jan 23 - The City Club, Cleveland, OH
Feb 11 - American Legion, Washington, DC
Feb 26 - Oxford University Debate, Oxford, UK
Feb 27 - Polynomics Conference, Boca Raton, FL
Mar 19 - Palm Beach Roundtable, Boca Raton, Fl
Mar 29 - Fairfax Presbyterian Church, Fairfax, VA
Apr 9 - Heritage Foundation, Washington, DC
Apr 23 - International Democrat Union, Washington, DC
Apr 30 - White House Fellows Alumni, Washington, DC
May 7 - Former Members of Congress, Washington, DC
Jun 11 - American Council of Young Political Leaders, Washington, DC
Jun 26 - City Club, San Diego, CA
Jun 30 - Standard Club, Chicago, IL
Jul 24 - Congressional Youth Leadership Council, Washington, DC
Jul 29 - Offense-Defense Seminar, Airlie House, Warrenton, VA
Aug 4 - Jr. Statesmen, Washington, DC
Sept 28 - Detroit Economic Club, Detroit, MI
Oct 5 - Washington Leadership Conference, Washington, DC
Oct 29 - Congressional Interns, Washington, DC

Organizations Sponsoring ACDA Speakers During 1987

AAAS Conference on Arms Control & National Security, Chiago, IL

American Academy of Arts & Sciences, Cambridge, MA
American Institute for Aeronautics & Astronautics, Dayton, OH
American Legion, Washington, DC Society, Washington, DC
American Physical Society, Washington, DC
Antioch College, Yellow Springs, OH
Brigham Young University, Provo, UT
Brooklyn Congressional District Debate, New York, NY
CSIS, Washington, DC
California State University, Dominguez Hills, CA
Capitol Hill Exchange Club, Washington, DC
Carlton College, Northfield, MN
Carnegie Endowment's Verification Project, Arlington, VA
Chicago CFR (Secondary Educators & Council Benefactors), IL
Cleveland State University, Cleveland, OH
Close Up Foundation, Washington, DC
Columbia University Conference, Wye Plantation, MD
Conference for Educators, Washington, DC
Conference on Disarmament, Baki, USSR
Federal Emergency Management Conference, St. Paul, MN
Department of Energy Senior Seminar, Wash., DC
Danish Parliamentarians, Washington, DC
Department of Defense, Copenhagen, DK
Ministry of Defense, Copenhagen, DK
Department of Defense, The Hague, NL
Downers Grove North HS, Downers Grove, IL
Dutch Peace & Security Council, The Hague, NL
Dutch Security Specialists, The Hague, NL
Experiment in International Living, Brattleboro, VT
FRG Journalists, USIA-sponsored, Washington, DC
Foreign Service Institute (FSI) Colloquium, Rosslyn, VA
FSI Jr. Officer Orientation, Washington, DC
Fairfax Presbyterian Church, Fairfax, VA
Federation of American Scientists, Warrenton, VA
Fermi Labs, Batavia, IL
Washington University, Washington, DC
Foreign Affairs Assoc., Waco, TX
Foreign Affairs Department, The Hague, NL
Foreign Ministry, Copenhagen, DK
German Marshall Fellows, Washington, DC
Great Peace March, Washington, DC
Harrisburg Community College, Washington, DC
Harvard University's Second Nordic Conf., Reykjavik, Iceland
Hochschule der Bundeswehr, Munich, FRG
Hunter College, New York, NY
Institute for Peace & Understanding, Catholic University, Washington, DC
Institute on East-West Security Studies, St. Paul, MN
International Studies Association, Washington, DC
Iowa Methodist Bishops Pastoral Conference, Des Moines, IO
Jersey Cape CND, Cape May, NJ
KING Radio, Seattle, WA
KLBJ-AM, Austin, TX
Kiwanis Club, Columbia, TN
Families for Defence, London, UK
Lawyers for Social Responsibility, Toronto, Canada
League of Women Voters Education Fund Conference, Washington, DC
Liberty Publ. House & Novoye Russkoye Slovo, New York, NY
Lions Club, Reno, NV
Marquette Univ. HS, Milwaukee, WI
Methodist Bishops House, Washington, DC
Methodist International Seminar, New York, NY

Minnesota Division of Emergency Management, St. Paul, MN
Moses Lake Rotary Club, Moses Lake, WA
Soviet Studies Research Center, Royal Military Academy
Sandhurst, Camberley, UK
North Stafford HS, Stafford, VA
Committee on Disarmament, New York, NY
Naples World Affairs Council, Naples, FL
Natl Defence College, Kingston, Canada
Natl Defense U. Symposium, Honolulu, HI
Natl. Council Int'l Visitors, Washington, DC
Navy League, Reno, NV
OPM Executive Seminar, Oak Ridge, TN
Okla. Argicultural Leadership Prgm., Washington, DC
Pacific Northwest Medical Education Institute, Everett, WA
Regis College, Denver, CO
Riverside University HS, Milwaukee, WI
Rotary Club, Charleston, WV
Rotary Club, Martinsburg, WV
Rotary Internat'l, Baltimore, MD
Rutgers University, Camden, NJ
SIPRI Conference, Stockholm, Sweden
St. Marks HS, Wilmington, DE
St. Petersburg, Florida Group, Washington, DC
St. Thomas More Society of MD, Bethesda, MD
Stanford University, San Francisco, CA
Students for Social Responsibility, Baltimore, MD
Swedish Institute for Foreign Affairs, Stockholm, Sweden
Swedish Professors Against Nuclear Arms Conference,
Stockholm, Sweden
TRW, Los Angeles, CA
Takoma Park HS, Takoma, MD
University of California San Diego, CA
UK Defense Information Group, Washington, DC
Cumberland Valley Foreign Pol. Study Group, Waynesboro, PA
USA Command & General Staff College, Ft. Leavenworth, KS
University of Wisconsin, Madison, WI
University of Pittsburgh, Pittsburgh, PA
Veterans of Foreign Wars, Torrington, CT
Voice of America Board of Directors, Washington, DC
Vögel Junior HS, Torrington, CT
W.T. Woodson H.S., Fairfax, VA
World Affairs Council, Cincinnati, OH
World Affairs Council, San Antonio, TX
WBAL-AB Radio, Baltimore
WHA-TV, Madison, WI
WTKN-AM, Pittsburgh, PA
WWL-AM, New Orleans, LA
Wenatchee Rotary Club, Wenatchee, WA
Westover School, Middlebury, CT
William Penn House, Washington, DC
Winston Churchill HS, Potomac, MD
World Affairs Council, San Antonio, TX
World Disarmament Conference, Beijing, PRC
Wright Patterson Civilian Career Development, OH
Yakima Rotary Club, Yakima, WA
Yale International Relations Club, New Haven, CT

Appendix V

APPEARANCES BY ACDA OFFICIALS AT 1987 CONGRESSIONAL COMMITTEE HEARINGS

Date	Title	Official	Committee
Jan 4	Threshold Test Ban Treaty/ Peaceful Nuclear Explosions Treaty	James McNally	SFRC
Feb 25	Nuclear Nonproliferation	Lewis Dunn	Gov't Affairs
Mar 10	ACDA Authorization	Kenneth Adelman	HFAC
Mar 12	Soviet Noncompliance	Kenneth Adelman	HFAC
Mar 24	ACDA Authorization	Kenneth Adelman	SFRC
Mar 25	ACDA Appropriations	Kenneth Adelman	SAC
Apr 24	Verification	Kenneth Adelman	SSCI
Jun 9	South Pacific Nuclear Free Zone	Norman Wulf	HFAC
Jun 15	ACDA Authorization	Kenneth Adelman	HFAC

Appendix VI

GENERAL ADVISORY COMMITTEE

The Arms Control and Disarmament Act (September 1961) provided for the appointment by the President of a General Advisory Committee to advise the ACDA Director on arms control and disarmament policy and activities and, from time to time, to advise the President, the Secretary of State, and the ACDA Director respecting matters affecting disarmament, world peace, and world law.

The 1987 General Advisory Committee consisted of the following members:

Roland F. Herbst. Associated with R&D Associates, Marina del Rey, California, since 1971. Formerly Deputy Director, Defense Research and Engineering (Space and Strategic Systems), Office of Secretary of Defense.

Francis P. Hoeber. President of Hoeber Corporation, Arlington, Virginia, since 1974. Formerly with the Rand Corporation (1968-1974) and the Stanford Research Institute (1960-1968).

Robert B. Hotz. Senior Editorial Consultant for McGraw-Hill Publications. Author and lecturer. Formerly editor-in-chief and publisher of Aviation Week and Space Technology magazine.

Eli S. Jacobs. A private businessman in Los Angeles, California.

Charles Burton Marshall. Resident consultant, Systems Planning Corporation, Arlington, Virginia. Formerly staff consultant to the House Committee on Foreign Affairs, member of State Department Policy Planning

staff, Professor of International Politics at Johns Hopkins School of Advanced International Studies, Washington, DC.

Jaime Oaxaca. President, Wilcox Electric, Incorporated, Kansas City, Missouri.

John P. Roche. Academic Dean and Professor of Civilization and Foreign Affairs at the Fletcher School of Law and Diplomacy, Tufts University, Medford, Massachusetts. Formerly consultant to the Vice President of the United States and the Department of State (1964-1966), and Special Consultant to the President (1966-1968).

Harriet Fast Scott. Author and lecturer. Consultant on Soviet military and political-military affairs to various research institutions and government organizations. Formerly with Stanford Research Institute.

Appendix VII

ACDA APPROPRIATIONS FOR FISCAL YEAR 1987

ACDA's FY 1987 salary and expense appropriation was $29,293,000.

Appendix VIII

Appendix VIII contains the INF Treaty and Protocols signed by Present Reagan and General Secretary Gorbachev on the elimination of intermediate-range and shorter-range missiles. Not included in Appendix VIII is the Memorandum of Understanding, an integral part of the Treaty which includes data and locations of missiles, launchers, support structures and support equipment.

TREATY BETWEEN THE UNITED STATES OF AMERICA and the UNION OF SOVIET SOCIALIST REPUBLICS ON THE ELIMINATION OF THEIR INTERMEDIATE-RANGE AND SHORTER-RANGE MISSILES

The United States of America and the Union of Soviet Socialist Republics, hereinafter referred to as the Parties,

Conscious that nuclear war would have devastating consequences for all mankind,

Guided by the objective of strengthening strategic stability,

Convinced that the measures set forth in this Treaty will help to reduce the risk of outbreak of war and strengthen international peace and security, and

Mindful of their obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons,

Have agreed as follows:

Article I

In accordance with the provisions of this Treaty which includes the Memorandum of Understanding and Protocols which form an integral part thereof, each Party shall eliminate its intermediate-range and shorter-range missiles, not have such systems thereafter, and carry out the other obligations set forth in this Treaty.

Article II

For the purposes of this Treaty:

1. The term "ballistic missile" means a missile that has a ballistic trajectory over most of its flight path. The term "ground-launched ballistic missile (GLBM)" means a ground-launched ballistic missile that is a weapon-delivery vehicle.

2. The term "cruise missile" means an unmanned, self-propelled vehicle that sustains flight through the use of aerodynamic lift over most of its flight path. The term "ground-launched cruise missile (GLCM)" means a ground-launched cruise missile that is a weapon-delivery vehicle.

3. The term "GLBM launcher" means a fixed launcher or a mobile land-based transporter-erector-launcher mechanism for launching a GLBM.

4. The term "GLCM launcher" means a fixed launcher or a mobile land-based transporter-erector-launcher mechanism for launching a GLCM.

5. The term "intermediate-range missile" means a GLBM or a GLCM having a range capability in excess of 1000 kilometers but not in excess of 5500 kilometers.

6. The term "shorter-range missile" means a GLBM or a GLCM having a range capability equal to or in excess of 500 kilometers but not in excess of 1000 kilometers.

7. The term "deployment area" means a designated area within which intermediate-range missiles and launchers of such missiles may operate and within which one or more missile operating bases are located.

8. The term "missile operating base" means:

(a) in the case of intermediate-range missiles, a complex of facilities, located within a deployment area, at which intermediate-range missiles and launchers of such missiles normally operate, in which support structures associated with such missiles and launchers are also located and in which support equipment associated with such missiles and launchers is normally located; and

(b) in the case of shorter-range missiles, a complex of facilities,

located any place, at which shorter-range missiles and launchers of such missiles normally operate and in which support equipment associated with such missiles and launchers is normally located.

9. The term "missile support facility," as regards intermediate-range or shorter-range missiles and launchers of such missiles, means a missile production facility or a launcher production facility, a missile repair facility or a launcher repair facility, a training facility, a missile storage facility or a launcher storage facility, a test range, or an elimination facility as those terms are defined in the Memorandum of Understanding.

10. The term "transit" means movement, notified in accordance with paragraph 5(f) of Article IX of this Treaty, of an intermediate-range missile or a launcher of such a missile between missile support facilities, between such a facility and a deployment area or between deployment areas, or of a shorter-range missile or a launcher of such a missile from a missile support facility or a missile operating base to an elimination facility.

11. The term "deployed missile" means an intermediate-range missile located within a deployment area or a shorter-range missile located at a missile operating base.

12. The term "non-deployed missile" means an intermediate-range missile located outside a deployment area or a shorter-range missile located outside a missile operating base.

13. The term "deployed launcher" means a launcher of an intermediate-range missile located within a deployment area or a launcher of a shorter-range missile located at a missile operating base.

14. The term "non-deployed launcher" means a launcher of an intermediate-range missile located outside a deployment area or a launcher of a shorter-range missile located outside a missile operating base.

15. The term "basing country" means a country other than the United States of America or the Union of Soviet Socialist Republics on whose territory intermediate-range or shorter-range missiles of the Parties, launchers of such missiles or support structures associated with such missiles and launchers were located at any time after November 1, 1987. Missiles or launchers in transit are not considered to be "located."

Article III

1. For the purposes of this Treaty, existing types of intermediate-range missiles are:

(a) for the United States of America, missiles of the types designated by the United States of America as the Pershing II and the BGM-109G, which are known to the Union of Soviet Socialist Republics by the same designations; and

(b) for the Union of Soviet Socialist Republics, missiles of the types designated by the Union of Soviet Socialist Republics as the RSD-10, the R-12 and the R-14, which are known to the United States of America as the SS-20, the SS-4 and the SS-5, respectively.

2. For the purposes of this Treaty, existing types of shorter-range missiles are:

(a) for the United States of America, missiles of the type designated by the United States of America as the Pershing IA, which is known to the Union of Soviet Socialist Republics by the same designation; and

(b) for the Union of Soviet Socialist Republics, missiles of the types designated by the Union of Soviet Socialist Republics as the OTR-22 and the OTR-23, which are known to the United States of America as the SS-12 and the SS-23, respectively.

Article IV

1. Each Party shall eliminate all its intermediate-range missiles and launchers of such missiles, and all support structures and support equipment of the categories listed in the Memorandum of Understanding associated with such missiles and launchers, so that no later than three years after entry into force of this Treaty and thereafter no such missiles, launchers, support structures or support equipment shall be possessed by either Party.

2. To implement paragraph 1 of this Article, upon entry into force of this Treaty, both Parties shall begin and continue throughout the duration of each phase, the reduction of all types of their deployed and non-deployed intermediate-range missiles and deployed and non-deployed launchers of such missiles and support structures and support equipment associated with such missiles and launchers in accordance with the provisions of this Treaty. These reductions shall be implemented in two phases so that:

(a) by the end of the first phase, that is, no later than 29 months after entry into force of this Treaty:

(i) the number of deployed launchers of intermediate-range missiles for each Party shall not exceed the number of launchers that are capable of carrying or containing at one time missiles considered by the Parties to carry 171 warheads;

(ii) the number of deployed intermediate-range missiles for each Party shall not exceed the number of such missiles considered by the Parties to carry 180 warheads;

(iii) the aggregate number of deployed and non-deployed launchers of intermediate-range missiles for each Party shall not exceed the number of launchers that are capable of carrying or containing at one time missiles considered by the Parties to carry 200 warheads;

(iv) the aggregate number of deployed and non-deployed intermediate-range missiles for each Party shall not exceed the number of such missiles considered by the Parties to carry 200 warheads; and

(v) the ratio of the aggregate number of deployed and non-deployed intermediate-range GLBMs of existing types for each Party to the aggregate number of deployed and non-deployed intermediate-range missiles of existing types possessed by that Party shall not exceed the ratio of such intermediate-range GLBMs to such intermediate-range missiles for that Party as of November 1, 1987, as set forth in the Memorandum of Understanding; and

(b) by the end of the second phase, that is, no later than three years after entry into force of this Treaty, all intermediate-range missiles of each Party, launchers of such missiles and all support structures and support equipment of the categories listed in the Memorandum of Understanding associated with such missiles and launchers, shall be eliminated.

Article V

1. Each Party shall eliminate all its shorter-range missiles and launchers of such missiles, and all support equipment of the categories listed in the Memorandum of Understanding associated with such missiles and launchers, so that no later than 18 months after entry into force of this Treaty and thereafter no such missiles, launchers or support equipment shall be possessed by either Party.

2. No later than 90 days after entry into force of this Treaty, each Party shall complete the removal of all its deployed shorter-range missiles and deployed and non-deployed launchers of such missiles to elimination facilities and shall retain them at those locations until they are eliminated in accordance with the procedures set forth in the Protocol on Elimination. No later than 12 months after entry into force of this Treaty, each Party shall complete the removal of all its non-deployed shorter-range missiles to elimination facilities and shall retain them at those locations until they are eliminated in accordance with the procedures set forth in the Protocol on Elimination.

3. Shorter-range missiles and launchers of such missiles shall not be located at the same elimination facility. Such facilities shall be separated by no less than 1000 kilometers.

Article VI

1. Upon entry into force of this Treaty and thereafter, neither Party shall:

(a) produce or flight-test any intermediate-range missiles or produce any stages of such missiles or any launchers of such missiles; or

(b) produce, flight-test or launch any shorter-range missiles or produce any stages of such missiles or any launchers of such missiles.

2. Notwithstanding paragraph 1 of this Article, each Party shall have the right to produce a type of GLBM not limited by this Treaty which uses a stage which is outwardly similar to, but not interchangeable with, a stage of an existing type of intermediate-range GLBM having more than one stage, providing that that Party does not produce any other stage which is outwardly similar to, but not interchangeable with, any other stage of an existing type of intermediate-range GLBM.

Article VII

For the purposes of this Treaty:

1. If a ballistic missile or a cruise missile has been flight-tested or deployed for weapon delivery, all missiles of that type shall be considered to be weapon-delivery vehicles.

2. If a GLBM or GLCM is an intermediate-range missile, all GLBMs or GLCMs of that type shall be considered to be intermediate-range missiles. If a GLBM or GLCM is a shorter-range missile, all GLBMs or GLCMs of that type shall be considered to be shorter-range missiles.

3. If a GLBM is of a type developed and tested solely to intercept and counter objects not located on the surface of the earth, it shall not be considered to be a missile to which the limitations of this Treaty apply.

4. The range capability of a GLBM not listed in Article III of this Treaty shall be considered to be the maximum range to which it has been tested. The range capability of a GLCM not listed in Article III of this Treaty shall be considered to be the maximum distance which can be covered by the missile in its standard design mode flying until fuel exhaustion, determined by projecting its flight path onto the earth's sphere from the point of launch to the point of impact. GLBMs or GLCMs that have a range capability equal to or in excess of 500 kilometers but not in excess of 1000 kilometers shall be considered to be shorter-range missiles. GLBMs or GLCMs that have a range capability in excess of 1000 kilometers but not in excess of 5500 kilometers shall be considered to be intermediate-range missiles.

5. The maximum number of warheads an existing type of intermediate-range missile or shorter-range missile carries shall be considered to be the number listed for missiles of that type in the Memorandum of Understanding.

6. Each GLBM or GLCM shall be considered to carry the maximum number of warheads listed for a GLBM or GLCM of that type in the Memorandum of Understanding.

7. If a launcher has been tested for launching a GLBM or a GLCM, all launchers of that type shall be considered to have been tested for launching GLBMs or GLCMs.

8. If a launcher has contained or launched a particular type of GLBM or GLCM, all launchers of that type shall be considered to be launchers of that type of GLBM or GLCM.

9. The number of missiles each launcher of an existing type of intermediate-range missile or shorter-range missile shall be considered to be capable of carrying or containing at one time is the number listed for launchers of missiles of that type in the Memorandum of Understanding.

10. Except in the case of elimination in accordance with the procedures set forth in the Protocol on Elimination, the following shall apply:

(a) for GLBMs which are stored or moved in separate stages, the longest stage of an intermediate-range or shorter-range GLBM shall be counted as a complete missile;

(b) for GLBMs which are not stored or moved in separate stages, a canister of the type used in the launch of an intermediate-range GLBM, unless a Party proves to the satisfaction of the other Party that it does not contain such a missile, or an assembled intermediate-range or shorter-range GLBM, shall be counted as a complete missile; and

(c) for GLCMs, the airframe of an intermediate-range or shorter-range GLCM shall be counted as a complete missile.

11. A ballistic missile which is not a missile to be used in a ground-based mode shall not be considered to be a GLBM if it is test-launched at a test site from a fixed land-based launcher which is used solely for test purposes and which is distinguishable from GLBM launchers. A cruise missile which is not a missile to be used in a ground-based mode shall not be considered to be a GLCM if it is test-launched at a test site from a fixed land-based launcher which is used solely for test purposes and which is distinguishable from GLCM launchers.

12. Each Party shall have the right to produce and use for booster systems, which might otherwise be considered to be intermediate-range or shorter-range missiles, only existing types of booster stages for such booster systems. Launches of such booster systems shall not be considered to be flight-testing of intermediate-range or shorter-range missiles provided that:

(a) stages used in such booster systems are different from stages used in those missiles listed as existing types of intermediate-range or shorter-range missiles in Article III of this Treaty;

(b) such booster systems are used only for research and development purposes to test objects other than the booster systems themselves;

(c) the aggregate number of launchers for such booster systems shall not exceed 35 for each Party at any one time; and

(d) the launchers for such booster systems are fixed, emplaced above ground and located only at research and development launch sites which are specified in the Memorandum of Understanding.

Research and development launch sites shall not be subject to inspection pursuant to Article XI of this Treaty.

Article VIII

1. All intermediate-range missiles and launchers of such missiles shall be located in deployment areas, at missile support facilities or shall be in transit. Intermediate-range missiles or launchers of such missiles shall not be located elsewhere.

2. Stages of intermediate-range missiles shall be located in deployment areas, at missile support facilities or moving between deployment areas, between missile support facilities or between missile support facilities and deployment areas.

3. Until their removal to elimination facilities as required by paragraph 2 of Article V of this Treaty, all shorter-range missiles and launchers of such missiles shall be located at missile operating bases, at missile support facilities or shall be in transit. Shorter-range missiles or launchers of such missiles shall not be located elsewhere.

4. Transit of a missile or launcher subject to the provisions of this Treaty shall be completed within 25 days.

5. All deployment areas, missile operating bases and missile support facilities are specified in the Memorandum of Understanding or in subsequent updates of data pursuant to paragraphs 3, 5(a) or 5(b) of Article IX of this Treaty. Neither Party shall increase the number of, or change the location or boundaries of, deployment areas, missile operating

bases or missile support facilities, except for elimination facilities, from those set forth in the Memorandum of Understanding. A missile support facility shall not be considered to be part of a deployment area even though it may be located within the geographic boundaries of a deployment area.

6. Beginning 30 days after entry into force of this Treaty, neither Party shall locate intermediate-range or shorter-range missiles, including stages of such missiles, or launchers of such missiles at missile production facilities, launcher production facilities or test ranges listed in the Memorandum of Understanding.

7. Neither Party shall locate any intermediate-range or shorter-range missiles at training facilities.

8. A non-deployed intermediate-range or shorter-range missile shall not be carried on or contained within a launcher of such a type of missile, except as required for maintenance conducted at repair facilities or for elimination by means of launching conducted at elimination facilities.

9. Training missiles and training launchers for intermediate-range or shorter-range missiles shall be subject to the same locational restrictions as are set forth for intermediate-range and shorter-range missiles and launchers of such missiles in paragraphs 1 and 3 of this Article.

Article IX

1. The Memorandum of Understanding contains categories of data relevant to obligations undertaken with regard to this Treaty and lists all intermediate-range and shorter-range missiles, launchers of such missiles, and support structures and support equipment associated with such missiles and launchers, possessed by the Parties as of November 1, 1987. Updates of that data and notifications required by this Article shall be provided according to the categories of data contained in the Memorandum of Understanding.

2. The Parties shall update that data and provide the notifications required by this Treaty through the Nuclear Risk Reduction Centers, established pursuant to the Agreement Between the United States of America and the Union of Soviet Socialist Republics on the Establishment of Nuclear Risk Reduction Centers of September 15, 1987.

3. No later than 30 days after entry into force of this Treaty, each Party shall provide the other Party with updated data, as of the date of entry into force of this Treaty, for all categories of data contained in the Memorandum of Understanding.

4. No later than 30 days after the end of each six-month interval following the entry into force of this Treaty, each Party shall provide updated data for all categories of data contained in the Memorandum of Understanding by informing the other Party of all changes, completed and in process, in that data, which have occurred during the six-month interval since the preceding data exchange, and the net effect of those changes.

5. Upon entry into force of this Treaty and thereafter, each Party shall provide the following notifications to the other Party:

(a) notification, no less than 30 days in advance, of the scheduled date of the elimination of a specific deployment area, missile operating base or missile support facility;

(b) notification, no less than 30 days in advance, of changes in the number or location of elimination facilities, including the location and scheduled date of each change;

(c) notification, except with respect to launches of intermediate-range missiles for the purpose of their elimination, no less than 30 days in advance, of the scheduled date of the initiation of the elimination of intermediate-range and shorter-range missiles, and stages of such missiles, and launchers of such missiles and support structures and support equipment associated with such missiles and launchers, including:

(i) the number and type of items of missile systems to be eliminated;

(ii) the elimination site;

(iii) for intermediate-range missiles, the location from which such missiles, launchers of such missiles and support equipment associated with such missiles and launchers are moved to the elimination facility; and

(iv) except in the case of support structures, the point of entry to be used by an inspection team conducting an inspection pursuant to paragraph 7 of Article XI of this Treaty and the estimated time of departure of an inspection team from the point of entry to the elimination facility;

(d) notification, no less than ten days in advance, of the scheduled date of the launch, or the scheduled date of the initiation of a series of launches, of intermediate-range missiles for the purpose of their elimination, including:

(i) the type of missiles to be eliminated;

(ii) the location of the launch, or, if elimination is by a series of launches, the location of such launches and the number of launches in the series;

(iii) the point of entry to be used by an inspection team conducting an inspection pursuant to paragraph 7 of Article XI of this Treaty; and

(iv) the estimated time of departure of an inspection team from the point of entry to the elimination facility;

(e) notification, no later than 48 hours after they occur, of changes in the number of intermediate-range and shorter-range missiles, launchers of such missiles and support structures and support equipment associated with such missiles and launchers resulting from elimination as described in the Protocol on Elimination, including:

(i) the number and type of items of a missile system which were eliminated; and

(ii) the date and location of such elimination; and

(f) notification of transit of intermediate-range or shorter-range missiles or launchers of such missiles, or the movement of

training missiles or training launchers for such intermediate-range and shorter-range missiles, no later than 48 hours after it has been completed, including:

(i) the number of missiles or launchers;

(ii) the points, dates and times of departure and arrival;

(iii) the mode of transport; and

(iv) the location and time at that location at least once every four days during the period of transit.

6. Upon entry into force of this Treaty and thereafter, each Party shall notify the other Party, no less than ten days in advance, of the scheduled date and location of the launch of a research and development booster system as described in paragraph 12 of Article VII of this Treaty.

Article X

1. Each Party shall eliminate its intermediate-range and shorter-range missiles and launchers of such missiles and support structures and support equipment associated with such missiles and launchers in accordance with the procedures set forth in the Protocol on Elimination.

2. Verification by on-site inspection of the elimination of items of missile systems specified in the Protocol on Elimination shall be carried out in accordance with Article XI of this Treaty, the Protocol on Elimination and the Protocol on Inspection.

3. When a Party removes its intermediate-range missiles, launchers of such missiles and support equipment associated with such missiles and launchers from deployment areas to elimination facilities for the purpose of their elimination, it shall do so in complete deployed organizational units. For the United States of America, these units shall be Pershing II batteries and BGM-109G flights. For the Union of Soviet Socialist Republics, these units shall be SS-20 regiments composed of two or three battalions.

4. Elimination of intermediate-range and shorter-range missiles and launchers of such missiles and support equipment associated with such missiles and launchers shall be carried out at the facilities that are specified in the Memorandum of Understanding or notified in accordance with paragraph 5(b) of Article IX of this Treaty, unless eliminated in accordance with Sections IV or V of the Protocol on Elimination. Support structures, associated with the missiles and launchers subject to this Treaty, that are subject to elimination shall be eliminated in situ.

5. Each Party shall have the right, during the first six months after entry into force of this Treaty, to eliminate by means of launching no more than 100 of its intermediate-range missiles.

6. Intermediate-range and shorter-range missiles which have been tested prior to entry into force of this Treaty, but never deployed, and which are not existing types of intermediate-range or shorter-range missiles listed in Article III of this Treaty, and launchers of such missiles, shall be eliminated within six months after entry into force of this Treaty in accordance with the procedures set forth in the Protocol on Elimination. Such missiles are:

(a) for the United States of America, missiles of the type designated by the United States of America as the Pershing IB,

which is known to the Union of Soviet Socialist Republics by the same designation; and

(b) for the Union of Soviet Socialist Republics, missiles of the type designated by the Union of Soviet Socialist Republics as the RK-55, which is known to the United States of America as the SSC-X-4.

7. Intermediate-range and shorter-range missiles and launchers of such missiles and support structures and support equipment associated with such missiles and launchers shall be considered to be eliminated after completion of the procedures set forth in the Protocol on Elimination and upon the notification provided for in paragraph 5(e) of Article IX of this Treaty.

8. Each Party shall eliminate its deployment areas, missile operating bases and missile support facilities. A Party shall notify the other Party pursuant to paragraph 5(a) of Article IX of this Treaty once the conditions set forth below are fulfilled:

(a) all intermediate-range and shorter-range missiles, launchers of such missiles and support equipment associated with such missiles and launchers located there have been removed;

(b) all support structures associated with such missiles and launchers located there have been eliminated; and

(c) all activity related to production, flight-testing, training, repair, storage or deployment of such missiles and launchers has ceased there.

Such deployment areas, missile operating bases and missile support facilities shall be considered to be eliminated either when they have been inspected pursuant to paragraph 4 of Article XI of this Treaty or when 60 days have elapsed since the date of the scheduled elimination which was notified pursuant to paragraph 5(a) of Article IX of this Treaty. A deployment area, missile operating base or missile support facility listed in the Memorandum of Understanding that met the above conditions prior to entry into force of this Treaty, and is not included in the initial data exchange pursuant to paragraph 3 of Article IX of this Treaty, shall be considered to be eliminated.

9. If a Party intends to convert a missile operating base listed in the Memorandum of Understanding for use as a base associated with GLBM or GLCM systems not subject to this Treaty, then that Party shall notify the other Party, no less than 30 days in advance of the scheduled date of the initiation of the conversion, of the scheduled date and the purpose for which the base will be converted.

Article XI

1. For the purpose of ensuring verification of compliance with the provisions of this Treaty, each Party shall have the right to conduct on-site inspections. The Parties shall implement on-site inspections in accordance with this Article, the Protocol on Inspection and the Protocol on Elimination.

2. Each Party shall have the right to conduct inspections provided for by this Article both within the territory of the other Party and within the territories of basing countries.

3. Beginning 30 days after entry into force of this Treaty, each Party

shall have the right to conduct inspections at all missile operating bases and missile support facilities specified in the Memorandum of Understanding other than missile production facilities, and at all elimination facilities included in the initial data update required by paragraph 3 of Article IX of this Treaty. These inspections shall be completed no later than 90 days after entry into force of this Treaty. The purpose of these inspections shall be to verify the number of missiles, launchers, support structures and support equipment and other data, as of the date of entry into force of this Treaty, provided pursuant to paragraph 3 of Article IX of this Treaty.

4. Each Party shall have the right to conduct inspections to verify the elimination, notified pursuant to paragraph 9(a) of Article IX of this Treaty, of missile operating bases and missile support facilities other than missile production facilities, which are thus no longer subject to inspections pursuant to paragraph 3(a) of this Article. Such an inspection shall be carried out within 60 days after the scheduled date of the elimination of that facility. If a Party conducts an inspection at a particular facility pursuant to paragraph 3 of this Article after the scheduled date of the elimination of that facility, then no additional inspection of that facility pursuant to this paragraph shall be permitted.

5. Each Party shall have the right to conduct inspections pursuant to this paragraph for 13 years after entry into force of this Treaty. Each Party shall have the right to conduct 20 such inspections per calendar year during the first three years after entry into force of this Treaty, 15 such inspections per calendar year during the subsequent five years, and ten such inspections per calendar year during the last five years. Neither Party shall use more than half of its total number of these inspections per calendar year within the territory of any one basing country. Each Party shall have the right to conduct:

(a) inspections, beginning 90 days after entry into force of this Treaty, of missile operating bases and missile support facilities other than elimination facilities and missile production facilities, to ascertain, according to the categories of data specified in the Memorandum of Understanding, the numbers of missiles, launchers, support structures and support equipment located at each missile operating base or missile support facility at the time of the inspection; and

(b) inspections of former missile operating bases and former missile support facilities eliminated pursuant to paragraph 4 of Article X of this Treaty other than former missile production facilities.

6. Beginning 30 days after entry into force of this Treaty, each Party shall have the right, for 13 years after entry into force of this Treaty, to inspect by means of continuous monitoring:

(a) the portals of any facility of the other Party at which the final assembly of a GLBM using stages, any of which is outwardly similar to a stage of a solid-propellant GLBM listed in Article III of this Treaty, is accomplished; or

(b) if a Party has no such facility, the portals of an agreed former missile production facility at which existing types of intermediate-range or shorter-range GLBMs were produced.

The Party whose facility is to be inspected pursuant to this paragraph shall ensure that the other Party is able to establish a permanent continuous monitoring system at that facility within six months after entry into force of this Treaty or within six months of initiation of the process

of final assembly described in subparagraph (a). If, after the end of the second year after entry into force of this Treaty, neither Party conducts the process of final assembly described in subparagraph (a) for a period of 12 consecutive months, then neither Party shall have the right to inspect by means of continuous monitoring any missile production facility of the other Party unless the process of final assembly as described in subparagraph (a) is initiated again. Upon entry into force of this Treaty, the facilities to be inspected by continuous monitoring shall be: in accordance with subparagraph (b), for the United States of America, Hercules Plant Number 1, at Magna, Utah; in accordance with subparagraph (a), for the Union of Soviet Socialist Republics, the Votkinsk Machine Building Plant, Udmurt Autonomous Soviet Socialist Republic, Russian Soviet Federative Socialist Republic.

7. Each Party shall conduct inspections of the process of elimination, including elimination of intermediate-range missiles by means of launching, of intermediate-range and shorter-range missiles and launchers of such missiles and support equipment associated with such missiles and launchers carried out at elimination facilities in accordance with Article X of this Treaty and the Protocol on Elimination. Inspectors conducting inspections provided for in this paragraph shall determine that the processes specified for the elimination of the missiles, launchers and support equipment have been completed.

8. Each Party shall have the right to conduct inspections to confirm the completion of the process of elimination of intermediate-range and shorter-range missiles and launchers of such missiles and support equipment associated with such missiles and launchers eliminated pursuant to Section V of the Protocol on Elimination, and of training missiles, training missile stages, training launch canisters and training launchers eliminated pursuant to Sections II, IV and V of the Protocol on Elimination.

Article XII

1. For the purpose of ensuring verification of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.

2. Neither Party shall:

(a) interfere with national technical means of verification of the other Party operating in accordance with paragraph 1 of this Article; or

(b) use concealment measures which impede verification of compliance with the provisions of this Treaty by national technical means of verification carried out in accordance with paragraph 1 of this Article. This obligation does not apply to cover or concealment practices, within a deployment area, associated with normal training, maintenance and operations, including the use of environmental shelters to protect missiles and launchers.

3. To enhance observation by national technical means of verification, each Party shall have the right until a treaty between the Parties reducing and limiting strategic offensive arms enters into force, but in any event for no more than three years after entry into force of this Treaty, to request the implementation of cooperative measures at deployment bases for road-mobile GLBMs with a range capability in excess of 5500 kilometers, which are not former missile operating bases eliminated pursuant to

paragraph 8 of Article X of this Treaty. The Party making such a request shall inform the other Party of the deployment base at which cooperative measures shall be implemented. The Party whose base is to be observed shall carry out the following cooperative measures:

(a) no later than six hours after such a request, the Party shall have opened the roofs of all fixed structures for launchers located at the base, removed completely all missiles on launchers from such fixed structures for launchers and displayed such missiles on launchers in the open without using concealment measures; and

(b) the Party shall leave the roofs open and the missiles on launchers in place until twelve hours have elapsed from the time of the receipt of a request for such an observation.

Each Party shall have the right to make six such requests per calendar year. Only one deployment base shall be subject to these cooperative measures at any one time.

Article XIII

1. To promote the objectives and implementation of the provisions of this Treaty, the Parties hereby establish the Special Verification Commission. The Parties agree that, if either Party so requests, they shall meet within the framework of the Special Verification Commission to:

(a) resolve questions relating to compliance with the obligations assumed; and

(b) agree upon such measures as may be necessary to improve the viability and effectiveness of this Treaty.

2. The Parties shall use the Nuclear Risk Reduction Centers, which provide for continuous communication between the Parties, to:

(a) exchange data and provide notifications as required by paragraphs 3, 4, 5 and 6 of Article IX of this Treaty and the Protocol on Elimination;

(b) provide and receive the information required by paragraph 9 of Article X of this Treaty;

(c) provide and receive notifications of inspections as required by Article XI of this Treaty and the Protocol on Inspection; and

(d) provide and receive requests for cooperative measures as provided for in paragraph 3 of Article XII of this Treaty.

Article XIV

The Parties shall comply with this Treaty and shall not assume any international obligations or undertakings which would conflict with its provisions.

Article XV

1. This Treaty shall be of unlimited duration.

2. Each Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extraordinary events

related to the subject matter of this Treaty have jeopardized its supreme interests. It shall give notice of its decision to withdraw to the other Party six months prior to withdrawal from this Treaty. Such notice shall include a statement of the extraordinary events the notifying Party regards as having jeopardized its supreme interests.

Article XVI

Each Party may propose amendments to this Treaty. Agreed amendments shall enter into force in accordance with the procedures set forth in Article XVII governing the entry into force of this Treaty.

Article XVII

1. This Treaty, including the Memorandum of Understanding and Protocols, which form an integral part thereof, shall be subject to ratification in accordance with the constitutional procedures of each Party. This Treaty shall enter into force on the date of the exchange of instruments of ratification.

2. This Treaty shall be registered pursuant to Article 102 of the Charter of the United Nations.

DONE at Washington on December 8, 1987, in two copies, each in the English and Russian languages, both texts being equally authentic.

FOR THE UNITED STATES OF AMERICA:

President of the United States of America

FOR THE UNION OF SOVIET SOCIALIST REPUBLICS:

General Secretary of the Central Committee of the CPSU

PROTOCOL
ON PROCEDURES GOVERNING THE ELIMINATION OF
THE MISSILE SYSTEMS SUBJECT TO THE TREATY BETWEEN
THE UNITED STATES OF AMERICA AND
THE UNION OF SOVIET SOCIALIST REPUBLICS
ON THE ELIMINATION OF THEIR INTERMEDIATE-RANGE AND
SHORTER-RANGE MISSILES

Pursuant to and in implementation of the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles of December 8, 1987, hereinafter referred to as the Treaty, the Parties hereby agree upon procedures governing the elimination of the missile systems subject to the Treaty.

I. Items of Missile Systems Subject to Elimination

The specific items for each type of missile system to be eliminated are:

1. For the United States of America:

Pershing II: missile, launcher and launch pad shelter;

BGM-109G: missile, launch canister and launcher;

Pershing IA: missile and launcher; and

Pershing IB: missile.

2. For the Union of Soviet Socialist Republics:

SS-20: missile, launch canister, launcher, missile transporter vehicle and fixed structure for a launcher;

SS-4: missile, missile transporter vehicle, missile erector, launch stand and propellant tanks;

SS-5: missile;

SSC-X-4: missile, launch canister and launcher;

SS-12: missile, launcher and missile transporter vehicle; and

SS-23: missile, launcher and missile transporter vehicle.

3. For both Parties, all training missiles, training missile stages, training launch canisters and training launchers shall be subject to elimination.

4. For both Parties, all stages of intermediate-range and shorter-range GLBMs shall be subject to elimination.

5. For both Parties, all front sections of deployed intermediate-range and shorter-range missiles shall be subject to elimination.II.

Procedures for Elimination at Elimination Facilities

1. In order to ensure the reliable determination of the type and number of missiles, missile stages, front sections, launch canisters, launchers, missile transporter vehicles, missile erectors and launch stands, as well as training missiles, training missile stages, training launch canisters and training launchers, indicated in Section I of this Protocol, being eliminated at elimination facilities, and to preclude the possibility of restoration of such items for purposes inconsistent with the provisions of the Treaty, the Parties shall fulfill the requirements below.

2. The conduct of the elimination procedures for the items of missile systems listed in paragraph 1 of this Section, except for training missiles, training missile stages, training launch canisters and training launchers, shall be subject to on-site inspection in accordance with Article XI of the Treaty and the Protocol on Inspection. The Parties shall have the right to conduct on-site inspections to confirm the completion of the elimination procedures set forth in paragraph 11 of this Section for training missiles, training missile stages, training launch canisters and training launchers. The Party possessing such a training missile, training missile stage, training launch canister or training launcher shall inform the other Party of the name and coordinates of the elimination facility at which the on-site inspection may be conducted as well as the date on which it may be conducted. Such information shall be provided no less than 30 days in advance of that date.

3. Prior to a missile's arrival at the elimination facility, its nuclear warhead device and guidance elements may be removed.

4. Each Party shall select the particular technological means necessary to implement the procedures required in paragraphs 10 and 11 of this Section and to allow for on-site inspection of the conduct of the elimination procedures required in paragraph 10 of this Section in accordance with Article XI of the Treaty, this Protocol and the Protocol on Inspection.

5. The initiation of the elimination of the items of missile systems subject to this Section shall be considered to be the commencement of the procedures set forth in paragraph 10 or 11 of this Section.

6. Immediately prior to the initiation of the elimination procedures set forth in paragraph 10 of this Section, an inspector from the Party receiving the pertinent notification required by paragraph 5(c) of Article IX of the Treaty shall confirm and record the type and number of items of missile systems, listed in paragraph 1 of this Section, which are to be eliminated. If the inspecting Party deems it necessary, this shall include a visual inspection of the contents of launch canisters.

7. A missile stage being eliminated by burning in accordance with the procedures set forth in paragraph 10 of this Section shall not be instrumented for data collection. Prior to the initiation of the elimination procedures set forth in paragraph 10 of this Section, an inspector from the inspecting Party shall confirm that such missile stages are not instrumented for data collection. Those missile stages shall be subject to continuous observation by such an inspector from the time of that inspection until the burning is completed.

8. The completion of the elimination procedures set forth in this Section, except those for training missiles, training missile stages, training launch canisters and training launchers, along with the type and number of items of missile systems for which those procedures have been completed, shall be confirmed in writing by the representative of the Party carrying out the elimination and by the inspection team leader of the other Party. The elimination of a training missile, training missile stage, training launch canister or training launcher shall be considered to have been completed upon completion of the procedures set forth in paragraph 11 of this Section and notification as required by paragraph 5(e) of Article IX of the Treaty following the date specified pursuant to paragraph 2 of this Section.

9. The Parties agree that all United States and Soviet intermediate-range and shorter-range missiles and their associated reentry vehicles shall be eliminated within an agreed overall period of elimination. It is further agreed that all such missiles shall, in fact, be eliminated fifteen days prior to the end of the overall period of elimination. During the last fifteen days, a Party shall withdraw to its national territory reentry vehicles which, by unilateral decision, have been released from existing programs of cooperation and eliminate them during the same timeframe in accordance with the procedures set forth in this Section.

10. The specific procedures for the elimination of the items of missile systems listed in paragraph 1 of this Section shall be as follows, unless the Parties agree upon different procedures to achieve the same result as the procedures identified in this paragraph:

For the Pershing II:

Missile:

(a) missile stages shall be eliminated by explosive demolition or burning;

(b) solid fuel, rocket nozzles and motor cases not destroyed in this process shall be burned, crushed, flattened or destroyed by explosion; and

(c) front section, minus nuclear warhead device and guidance elements, shall be crushed or flattened.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher chassis;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment, including external instrumentation compartments, shall be removed from launcher chassis; and

(d) launcher chassis shall be cut at a location that is not an assembly joint into two pieces of approximately equal size.

For the BGM-109G:

Missile:

(a) missile airframe shall be cut longitudinally into two pieces;

(b) wings and tail section shall be severed from missile airframe at locations that are not assembly joints; and

(c) front section, minus nuclear warhead device and guidance elements, shall be crushed or flattened.

Launch Canister:

launch canister shall be crushed, flattened, cut into two pieces of approximately equal size or destroyed by explosion.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher chassis;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment, including external instrumentation compartments, shall be removed from launcher chassis; and

(d) launcher chassis shall be cut at a location that is not an assembly joint into two pieces of approximately equal size.

For the Pershing IA:

Missile:

(a) missile stages shall be eliminated by explosive demolition or burning;

(b) solid fuel, rocket nozzles and motor cases not destroyed in this process shall be burned, crushed, flattened or destroyed by explosion; and

(c) front section, minus nuclear warhead device and guidance elements, shall be crushed or flattened.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher chassis;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment, including external instrumentation compartments, shall be removed from launcher chassis; and

(d) launcher chassis shall be cut at a location that is not an assembly joint into two pieces of approximately equal size.

For the Pershing IB:

Missile:

(a) missile stage shall be eliminated by explosive demolition or burning;

(b) solid fuel, rocket nozzle and motor case not destroyed in this process shall be burned, crushed, flattened or destroyed by explosion; and

(c) front section, minus nuclear warhead device and guidance elements, shall be crushed or flattened.

For the SS-20:

Missile:

(a) missile shall be eliminated by explosive demolition of the missile in its launch canister or by burning missile stages;

(b) solid fuel, rocket nozzles and motor cases not destroyed in this process shall be burned, crushed, flattened or destroyed by explosion; and

(c) front section, including reentry vehicles, minus nuclear warhead devices, and instrumentation compartment, minus guidance elements, shall be crushed or flattened.

Launch Canister:

launch canister shall be destroyed by explosive demolition together with a missile, or shall be destroyed separately by explosion, cut into two pieces of approximately equal size, crushed or flattened.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher chassis;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment, including external instrumentation compartments, shall be removed from launcher chassis;

(d) mountings of erector-launcher mechanism and launcher leveling supports shall be cut off launcher chassis;

(e) launcher leveling supports shall be c at locations that are not assembly joints into two pieces of approximately equal size; and

(f) a portion of the launcher chassis, at least 0.78 meters in length, shall be cut off aft of the rear axle.

Missile Transporter Vehicle:

(a) all mechanisms associated with missile loading and mounting shall be removed from transporter vehicle chassis;

(b) all mountings of such mechanisms shall be cut off transporter vehicle chassis;

(c) all components of the mechanisms associated with missile loading and mounting shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(d) external instrumentation compartments shall be removed from transporter vehicle chassis;

(e) transporter vehicle leveling supports shall be cut off transporter vehicle chassis and cut at locations that are not assembly joints into two pieces of approximately equal size; and

(f) a portion of the transporter vehicle chassis, at least 0.78 meters in length, shall be cut off aft of the rear axle.

For the SS-4:

Missile:

(a) nozzles of propulsion system shall be cut off at locations that are not assembly joints;

(b) all propellant tanks shall be cut into two pieces of approximately equal size;

(c) instrumentation compartment, minus guidance elements, shall be cut into two pieces of approximately equal size; and

(d) front section, minus nuclear warhead device, shall be crushed or flattened.

Launch Stand:

launch stand components shall be cut at locations that are not assembly joints into two pieces of approximately equal size.

Missile Erector:

(a) jib, missile erector leveling supports and missile erector mechanism shall be cut off missile erector at locations that are not assembly joints; and

(b) jib and missile erector leveling supports shall be cut into two pieces of approximately equal size.

Missile Transporter Vehicle:

mounting components for a missile and for a missile erector mechanism as well as supports for erecting a missile onto a launcher shall be cut off transporter vehicle at locations that are not assembly joints.

For the SS-5:

Missile:

(a) nozzles of propulsion system shall be cut off at locations that are not assembly joints;

(b) all propellant tanks shall be cut into two pieces of approximately equal size; and

(c) instrumentation compartment, minus guidance elements, shall be cut into two pieces of approximately equal size.

For the SSC-X-4:

Missile:

(a) missile airframe shall be cut longitudinally into two pieces;

(b) wings and tail section shall be severed from missile airframe at locations that are not assembly joints; and

(c) front section, minus nuclear warhead device and guidance elements, shall be crushed or flattened.

Launch Canister:

launch canister shall be crushed, flattened, cut into two pieces of approximately equal size or destroyed by explosion.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher chassis;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment, including external instrumentation compartments, shall be removed from launcher chassis;

(d) mountings of erector-launcher mechanism and launcher leveling supports shall be cut off launcher chassis;

(e) launcher leveling supports shall be cut at locations that are not assembly joints into two pieces of approximately equal size; and

(f) the launcher chassis shall be severed at a location determined by measuring no more than 0.70 meters rearward from the rear axle.

For the SS-12:

Missile:

(a) missile shall be eliminated by explosive demolition or by burning missile stages;

(b) solid fuel, rocket nozzles and motor cases not destroyed in this process shall be burned, crushed, flattened or destroyed by explosion; and

(c) front section, minus nuclear warhead device, and instrumentation compartment, minus guidance elements, shall be crushed, flattened or destroyed by explosive demolition together with a missile.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher chassis;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment, including external instrumentation compartments, shall be removed from launcher chassis;

(d) mountings of erector-launcher mechanism and launcher leveling supports shall be cut off launcher chassis;

(e) launcher leveling supports shall be cut at locations that are not assembly joints into two pieces of approximately equal size; and

(f) a portion of the launcher chassis, at least 1.10 meters in length, shall be cut off aft of the rear axle.

Missile Transporter Vehicle:

(a) all mechanisms associated with missile loading and mounting shall be removed from transporter vehicle chassis;

(b) all mountings of such mechanisms shall be cut off transporter vehicle chassis;

(c) all components of the mechanisms associated with missile loading and mounting shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(d) external instrumentation compartments shall be removed from transporter vehicle chassis;

(e) transporter vehicle leveling supports shall be cut off transporter vehicle chassis and cut at locations that are not assembly joints into two pieces of approximately equal size; and

(f) a portion of the transporter vehicle chassis, at least 1.10 meters in length, shall be cut off aft of the rear axle.

For the SS-23:

Missile:

(a) missile shall be eliminated by explosive demolition or by burning the missile stage;

(b) solid fuel, rocket nozzle and motor case not destroyed in this process shall be burned, crushed, flattened or destroyed by explosion; and

(c) front section, minus nuclear warhead device, and instrumentation compartment, minus guidance elements, shall be crushed, flattened, or destroyed by explosive demolition together with a missile.

Launcher:

(a) erector-launcher mechanism shall be removed from launcher body;

(b) all components of erector-launcher mechanism shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(c) missile launch support equipment shall be removed from launcher body;

(d) mountings of erector-launcher mechanism and launcher leveling supports shall be cut off launcher body;

(e) launcher leveling supports shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(f) each environmental cover of the launcher body shall be removed and cut into two pieces of approximately equal size; and

(g) a portion of the launcher body, at least 0.85 meters in length, shall be cut off aft of the rear axle.

Missile Transporter Vehicle:

(a) all mechanisms associated with missile loading and mounting shall be removed from transporter vehicle body;

(b) all mountings of such mechanisms shall be cut off transporter vehicle body;

(c) all components of mechanisms associated with missile loading and mounting shall be cut at locations that are not assembly joints into two pieces of approximately equal size;

(d) control equipment of the mechanism associated with missile loading shall be removed from transporter vehicle body;

(e) transporter vehicle leveling supports shall be cut off transporter vehicle body and cut at locations that are not assembly joints into two pieces of approximately equal size; and

(f) a portion of the transporter vehicle body, at least 0.85 meters in length, shall be cut off aft of the rear axle.

11. The specific procedures for the elimination of the training missiles, training missile stages, training launch canisters and training launchers indicated in paragraph 1 of this Section shall be as follows:

Training Missile and Training Missile Stage:

training missile and training missile stage shall be crushed, flattened, cut into two pieces of approximately equal size or destroyed by explosion.

Training Launch Canister:

training launch canister shall be crushed, flattened, cut into two pieces of approximately equal size or destroyed by explosion.

Training Launcher:

training launcher chassis shall be cut at the same location designated in paragraph 10 of this Section for launcher of the same type of missile.

III. Elimination of Missiles by Means of Launching

1. Elimination of missiles by means of launching pursuant to paragraph 5 of Article X of the Treaty shall be subject to on-site inspection in accordance with paragraph 7 of Article XI of the Treaty and the Protocol on Inspection. Immediately prior to each launch conducted for the purpose of elimination, an inspector from the inspecting Party shall confirm by visual observation the type of missile to be launched.

2. All missiles being eliminated by means of launching shall be launched from designated elimination facilities to existing impact areas for such missiles. No such missile shall be used as a target vehicle for a ballistic missile interceptor.

3. Missiles being eliminated by means of launching shall be launched one at a time, and no less than six hours shall elapse between such launches.

4. Such launches shall involve ignition of all missile stages. Neither Party shall transmit or recover data from missiles being eliminated by means of launching except for unencrypted data used for range safety purposes.

5. The completion of the elimination procedures set forth in this Section, and the type and number of missiles for which those procedures have been completed, shall be confirmed in writing by the representative of the Party carrying out the elimination and by the inspection team leader of the other Party.

6. A missile shall be considered to be eliminated by means of

launching after completion of the procedures set forth in this Section and upon notification required by paragraph 5(e) of Article IX of the Treaty.

IV. Procedures for Elimination In Situ

1. Support Structures

(a) Support structures listed in Section I of this Protocol shall be eliminated in situ.

(b) The initiation of the elimination of support structures shall be considered to be the commencement of the elimination procedures required in paragraph 1(d) of this Section.

(c) The elimination of support structures shall be subject to verification by on-site inspection in accordance with paragraph 4 of Article XI of the Treaty.

(d) The specific elimination procedures for support structures shall be as follows:

(i) the superstructure of the fixed structure or shelter shall be dismantled or demolished, and removed from its base or foundation;

(ii) the base or foundation of the fixed structure or shelter shall be destroyed by excavation or explosion;

(iii) the destroyed base or foundation of a fixed structure or shelter shall remain visible to national technical means of verification for six months or until completion of an on-site inspection conducted in accordance with Article XI of the Treaty; and

(iv) upon completion of the above requirements, the elimination procedures shall be considered to have been completed.

2. Propellant Tanks for SS-4 Missiles

Fixed and transportable propellant tanks for SS-4 missiles shall be removed from launch sites.

3. Training Missiles, Training Missile Stages, Training Launch Canisters and Training Launchers

(a) Training missiles, training missile stages, training launch canisters and training launchers not eliminated at elimination facilities shall be eliminated in situ.

(b) Training missiles, training missile stages, training launch canisters and training launchers being eliminated in situ shall be eliminated in accordance with the specific procedures set forth in paragraph 11 of Section II of this Protocol.

(c) Each Party shall have the right to conduct an on-site inspection to confirm the completion of the elimination procedures for training missiles, training missile stages, training launch canisters and training launchers.

(d) The Party possessing such a training missile, training missile stage, training launch canister or training launcher shall

inform the other Party of the place-name and coordinates of the location at which the on-site inspection provided for in paragraph 3(c) of this Section may be conducted as well as the date on which it may be conducted. Such information shall be provided no less than 30 days in advance of that date.

(e) Elimination of a training missile, training missile propulsion unit, training launch canister or training launcher shall be considered to have been completed upon the completion of the procedures required by this paragraph and upon certification as required by paragraph 3(c) of Article IX of the Treaty following the data specified pursuant to paragraph 2(c) of this Section.

V. Other Cases of Elimination

1. Cases of Accidental Destruction

(a) If an item limited by Section I of this Protocol is lost or destroyed as a result of an accident, the possessing Party shall notify the other Party within 48 hours, as required by paragraph 3(b) of Article IX of the Treaty, that the item has been eliminated.

(b) Such notification shall include the type of the eliminated item, the approximate or assumed location and the circumstances related to the case of accidental destruction.

(c) In such a case, the other Party shall have the right to conduct an inspection of the specific point at which the accident occurred to provide confidence that the item has been eliminated.

2. Missile Displays

(a) The Parties shall have the right to eliminate missiles, launch canisters and launchers, as well as training missiles, training launch canisters and training launchers, limited by Section I of this Protocol, by placing them on static displays. Each Party shall be limited to a total of 15 missiles, 15 launch canisters and 15 launchers on such static displays.

(b) Prior to being placed on static display, a missile, launch canister or launcher shall be rendered unusable for purposes inconsistent with the Treaty. Missile propellant shall be removed and erection-launcher mechanisms shall be rendered inoperative.

(c) The Party possessing a missile, launch canister or launcher, as well as a training missile, training launch canister or training launcher that is to be eliminated by placing it on static display shall provide the other Party with the place-name and coordinates of the location at which such a missile, launch canister or launcher is to be on static display, as well as the location at which the on-site inspection provided for in paragraph 3(c) of this Section, may take place.

(d) Each Party shall have the right to conduct the on-site inspection of such a missile, launch canister or launcher within 48 hours of receipt of the notification required by paragraph 3(c) of this Section.

(e) Elimination of a missile, launch canister or launcher, as well as a training missile, training launch canister or training launcher, by placing it on static display shall be considered to have been completed upon completion of the procedures required by this paragraph and notification as required by paragraph 5(e) of Article IX of the Treaty.

This Protocol is an integral part of the Treaty. It shall enter into force on the date of the entry into force of the Treaty and shall remain in force so long as the Treaty remains in force. As provided for in paragraph 1(b) of Article XIII of the Treaty, the Parties may agree upon such measures as may be necessary to improve the viability and effectiveness of this Protocol. Such measures shall not be deemed amendments to the Treaty.

DONE at Washington on December 8, 1987, in two copies, each in the English and Russian languages, both texts being equally authentic.

FOR THE UNITED STATES OF AMERICA:

President of the United States of America

FOR THE UNION OF SOVIET SOCIALIST REPUBLICS:

General Secretary of the Central Committee of the CPSU

PROTOCOL REGARDING INSPECTIONS RELATING TO THE TREATY BETWEEN THE UNITED STATES OF AMERICA AND THE UNION OF SOVIET SOCIALIST REPUBLICS ON THE ELIMINATION OF THEIR INTERMEDIATE-RANGE AND SHORTER-RANGE MISSILES

Pursuant to and in implementation of the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles of December 8, 1987, hereinafter referred to as the Treaty, the Parties hereby agree upon procedures governing the conduct of inspections provided for in Article XI of the Treaty.

1. Definitions

For the purposes of this Protocol, the Treaty, the Memorandum of Understanding and the Protocol on Elimination:

1. The term "inspected Party" means the Party to the Treaty whose sites are subject to inspection as provided for by Article XI of the Treaty.

2. The term "inspecting Party" means the Party to the Treaty carrying out an inspection.

3. The term "inspector" means an individual designated by one of the Parties to carry out inspections and included on that Party's list of

inspectors in accordance with the provisions of Section III of this Protocol.

4. The term "inspection team" means the group of inspectors assigned by the inspecting Party to conduct a particular inspection.

5. The term "inspection site" means an area, location or facility at which an inspection is carried out.

6. The term "period of inspection" means the period of time from arrival of the inspection team at the inspection site until its departure from the inspection site, exclusive of time spent on any pre- and post-inspection procedures.

7. The term "point of entry" means: Washington, D.C., or San Francisco, California, the United States of America; Brussels (National Airport), The Kingdom of Belgium; Frankfurt (Rhein Main Airbase), The Federal Republic of Germany; Rome (Ciampino), The Republic of Italy; Schiphol, The Kingdom of the Netherlands; RAF Greenham Common, The United Kingdom of Great Britain and Northern Ireland; Moscow, or Irkutsk, the Union of Soviet Socialist Republics; Schkeuditz Airport, the German Democratic Republic; and International Airport Ruzyne, the Czechoslovak Socialist Republic.

8. The term "in-country period" means the period from the arrival of the inspection team at the point of entry until its departure from the country through the point of entry.

9. The term "in-country escort" means individuals specified by the inspected Party to accompany and assist inspectors and aircrew members as necessary throughout the in-country period.

10. The term "aircrew member" means an individual who performs duties related to the operation of an airplane and who is included on a Party's list of aircrew members in accordance with the provisions of Section III of this Protocol.

II. General Obligations

1. For the purpose of ensuring verification of compliance with the provisions of the Treaty, each Party shall facilitate inspection by the other Party pursuant to this Protocol.

2. Each Party takes note of the assurances received from the other Party regarding understandings reached between the other Party and the basing countries to the effect that the basing countries have agreed to the conduct of inspections, in accordance with the provisions of this Protocol, on their territories.

III. Pre-Inspection Requirements

1. Inspections to ensure verification of compliance by the Parties with the obligations assumed under the Treaty shall be carried out by inspectors designated in accordance with paragraphs 3 and 4 of this Section.

2. No later than one day after entry into force of the Treaty, each Party shall provide to the other Party: a list of its proposed aircrew members; a list of its proposed inspectors who will carry out inspections pursuant to paragraphs 3, 4, 5, 7 and 8 of Article XI of the Treaty; and a list of its proposed inspectors who will carry out inspection activities

pursuant to paragraph 6 of Article XI of the Treaty. None of these lists shall contain at any time more than 200 individuals.

3. Each Party shall review the lists of inspectors and aircrew members proposed by the other Party. With respect to an individual included on the list of proposed inspectors who will carry out inspection activities pursuant to paragraph 6 of Article XI of the Treaty, if such an individual is unacceptable to the Party reviewing the list, that Party shall, within 20 days, so inform the Party providing the list, and the individual shall be deemed not accepted and shall be deleted from the list. With respect to an individual on the list of proposed aircrew members or the list of proposed inspectors who will carry out inspections pursuant to paragraphs 3, 4, 5, 7 and 8 of Article XI of the Treaty, each Party, within 20 days after the receipt of such lists, shall inform the other Party of its agreement to the designation of each inspector and aircrew member proposed. Inspectors shall be citizens of the inspecting Party.

4. Each Party shall have the right to amend its lists of inspectors and aircrew members. New inspectors and aircrew members shall be designated in the same manner as set forth in paragraph 3 of this Section with respect to the initial lists.

5. Within 30 days of receipt of the initial lists of inspectors and aircrew members, or of subsequent changes thereto, the Party receiving such information shall provide, or shall ensure the provision of, such visas and other documents to each individual to whom it has agreed as may be required to ensure that each inspector or aircrew member may enter and remain in the territory of the Party or basing country in which an inspection site is located throughout the in-country period for the purpose of carrying out inspection activities in accordance with the provisions of this Protocol. Such visas and documents shall be valid for a period of at least 24 months.

6. To exercise their functions effectively, inspectors and aircrew members shall be accorded, throughout the in-country period, privileges and immunities in the country of the inspection site as set forth in the Annex to this Protocol.

7. Without prejudice to their privileges and immunities, inspectors and aircrew members shall be obliged to respect the laws and regulations of the State on whose territory an inspection is carried out and shall be obliged not to interfere in the internal affairs of that State. In the event the inspected Party determines that an inspector or aircrew member of the other Party has violated the conditions governing inspection activities set forth in this Protocol, or has ever committed a criminal offense on the territory of the inspected Party or a basing country, or has ever been sentenced for committing a criminal offense or expelled by the inspected Party or a basing country, the inspected Party making such a determination shall so notify the inspecting Party, which shall immediately strike the individual from the lists of inspectors or the list of aircrew members. If, at that time, the individual is on the territory of the inspected Party or a basing country, the inspecting Party shall immediately remove that individual from the country.

8. Within 30 days after entry into force of the Treaty, each Party shall inform the other Party of the standing diplomatic clearance number for airplanes of the Party transporting inspectors and equipment necessary for inspection into and out of the territory of the Party or basing country in which an inspection site is located. Aircraft routings to and from the designated point of entry shall be along established international airways that are agreed upon by the Parties as the basis for such diplomatic clearance.

IV. Notifications

1. Notification of an intention to conduct an inspection shall be made through the Nuclear Risk Reduction Centers. The receipt of this notification shall be acknowledged through the Nuclear Risk Reduction Centers by the inspected Party within one hour of its receipt.

(a) For inspections conducted pursuant to paragraphs 3, 4 or 5 of Article XI of the Treaty, such notifications shall be made no less than 16 hours in advance of the estimated time of arrival of the inspection team at the point of entry and shall include:

(i) the point of entry;

(ii) the date and estimated time of arrival at the point of entry;

(iii) the date and time when the specification of the inspection site will be provided; and

(iv) the names of inspectors and aircrew members.

(b) For inspections conducted pursuant to paragraphs 7 or 8 of Article XI of the Treaty, such notifications shall be made no less than 72 hours in advance of the estimated time of arrival of the inspection team at the point of entry and shall include:

(i) the point of entry;

(ii) the date and estimated time of arrival at the point of entry;

(iii) the site to be inspected and the type of inspection; and

(iv) the names of inspectors and aircrew members.

2. The date and time of the specification of the inspection site as notified pursuant to paragraph 1(a) of this Section shall fall within the following time intervals:

(a) for inspections conducted pursuant to paragraphs 4 or 5 of Article XI of the Treaty, neither less than four hours nor more than 24 hours after the estimated date and time of arrival at the point of entry; and

(b) for inspections conducted pursuant to paragraph 3 of Article XI of the Treaty, neither less than four hours nor more than 48 hours after the estimated date and time of arrival at the point of entry.

3. The inspecting Party shall provide the inspected Party with a flight plan, through the Nuclear Risk Reduction Centers, for its flight from the last airfield prior to entering the airspace of the country in which the inspection site is located to the point of entry, no less than six hours before the scheduled departure time from that airfield. Such a plan shall be filed in accordance with the procedures of the International Civil Aviation Organization applicable to civil aircraft. The inspecting Party shall include in the remarks section of each flight plan the standing diplomatic clearance number and the notation: "Inspection aircraft. Priority clearance processing required."

4. No less than three hours prior to the scheduled departure of the inspection team from the last airfield prior to entering the airspace of the country in which the inspection is to take place, the inspected Party shall ensure that the flight plan filed in accordance with paragraph 3 of this Section is approved so that the inspection team may arrive at the point of entry by the estimated arrival time.

5. Either Party may change the point or points of entry to the territories of the countries within which its deployment areas, missile operating bases or missile support facilities are located, by giving notice of such change to the other Party. A change in a point of entry shall become effective five months after receipt of such notification by the other Party.

V. Activities Beginning Upon Arrival at the Point of Entry

1. The in-country escort and a diplomatic aircrew escort accredited to the Government of either the inspected Party or the basing country in which the inspection site is located shall meet the inspection team and aircrew members at the point of entry as soon as the airplane of the inspecting Party lands. The number of aircrew members for each airplane shall not exceed ten. The in-country escort shall expedite the entry of the inspection team and aircrew, their baggage, and equipment and supplies necessary for inspection, into the country in which the inspection site is located. A diplomatic aircrew escort shall have the right to accompany and assist aircrew members throughout the in-country period. In the case of an inspection taking place on the territory of a basing country, the in-country escort may include representatives of that basing country.

2. An inspector shall be considered to have assumed his duties upon arrival at the point of entry on the territory of the inspected Party or a basing country, and shall be considered to have ceased performing those duties when he has left the territory of the inspected Party or basing country.

3. Each Party shall ensure that equipment and supplies are exempt from all customs duties.

4. Equipment and supplies which the inspecting Party brings into the country in which an inspection site is located shall be subject to examination at the point of entry each time they are brought into that country. This examination shall be completed prior to the departure of the inspection team from the point of entry to conduct an inspection. Such equipment and supplies shall be examined by the in-country escort in the presence of the inspection team members to ascertain to the satisfaction of each Party that the equipment and supplies cannot perform functions unconnected with the inspection requirements of the Treaty. If it is established upon examination that the equipment or supplies are unconnected with these inspection requirements, then they shall not be cleared for use and shall be impounded at the point of entry until the departure of the inspection team from the country where the inspection is conducted. Storage of the inspecting Party's equipment and supplies at each point of entry shall be within tamper-proof containers within a secure facility. Access to each secure facility shall be controlled by a "dual key" system requiring the presence of both Parties to gain access to the equipment and supplies.

5. Throughout the in-country period, the inspected Party shall provide, or arrange for the provision of, meals, lodging, work space, transportation and, as necessary, medical care for the inspection team and aircrew of the inspecting Party. All the costs in connection with the stay of inspectors carrying out inspection activities pursuant to paragraph 6 of

Article XI of the Treaty, on the territory of the inspected Party, including meals, services, lodging, work space, transportation and medical care shall be borne by the inspecting Party.

6. The inspected Party shall provide parking, security protection, servicing and fuel for the airplane of the inspecting Party at the point of entry. The inspecting Party shall bear the cost of such fuel and servicing.

7. For inspections conducted on the territory of the Parties, the inspection team shall enter at the point of entry on the territory of the inspected Party that is closest to the inspection site. In the case of inspections carried out in accordance with paragraphs 3, 4 or 5 of Article XI of the Treaty, the inspection team leader shall, at or before the time notified pursuant to paragraph 1(a)(iii) of Section IV of this Protocol, inform the inspected Party at the point of entry through the in-country escort of the type of inspection and the inspection site, by place-name and geographic coordinates.

VI. General Rules for Conducting Inspections

1. Inspectors shall discharge their functions in accordance with this Protocol.

2. Inspectors shall not disclose information received during inspections except with the express permission of the inspecting Party. They shall remain bound by this obligation after their assignment as inspectors has ended.

3. In discharging their functions, inspectors shall not interfere directly with on-going activities at the inspection site and shall avoid unnecessarily hampering or delaying the operation of a facility or taking actions affecting its safe operation.

4. Inspections shall be conducted in accordance with the objectives set forth in Article XI of the Treaty as applicable for the type of inspection specified by the inspecting Party under paragraph 1(b) of Section IV or paragraph 7 of Section V of this Protocol.

5. The in-country escort shall have the right to accompany and assist inspectors and aircrew members as considered necessary by the inspected Party throughout the in-country period. Except as otherwise provided in this Protocol, the movement and travel of inspectors and aircrew members shall be at the discretion of the in-country escort.

6. Inspectors carrying out inspection activities pursuant to paragraph 6 of Article XI of the Treaty shall be allowed to travel within 50 kilometers from the inspection site with the permission of the in-country escort, and as considered necessary by the inspected Party, shall be accompanied by the in-country escort. Such travel shall be taken solely as a leisure activity.

7. Inspectors shall have the right throughout the period of inspection to be in communication with the embassy of the inspecting Party located within the territory of the country where the inspection is taking place using the telephone communications provided by the inspected Party.

8. At the inspection site, representatives of the inspected facility shall be included among the in-country escort.

9. The inspection team may bring onto the inspection site such documents as needed to conduct the inspection, as well as linear

measurement devices; cameras; portable weighing devices; radiation detection devices; and other equipment, as agreed by the Parties. The characteristics and method of use of the equipment listed above, shall also be agreed upon within 30 days after entry into force of the Treaty. During inspections conducted pursuant to paragraphs 3, 4, 5(a), 7 or 8 of Article XI of the Treaty, the inspection team may use any of the equipment listed above, except for cameras, which shall be for use only by the inspected Party at the request of the inspecting Party. During inspections conducted pursuant to paragraph 5(b) of Article XI of the Treaty, all measurements shall be made by the inspected Party at the request of the inspecting Party. At the request of inspectors, the in-country escort shall take photographs of the inspected facilities using the inspecting Party's camera systems which are capable of producing duplicate, instant development photographic prints. Each Party shall receive one copy of every photograph.

10. For inspections conducted pursuant to paragraphs 3, 4, 5, 7 or 8 of Article XI of the Treaty, inspectors shall permit the in-country escort to observe the equipment used during the inspection by the inspection team.

11. Measurements recorded during inspections shall be certified by the signature of a member of the inspection team and a member of the in-country escort when they are taken. Such certified data shall be included in the inspection report.

12. Inspectors shall have the right to request clarifications in connection with ambiguities that arise during an inspection. Such requests shall be made promptly through the in-country escort. The in-country escort shall provide the inspection team, during the inspection, with such clarifications as may be necessary to remove the ambiguity. In the event questions relating to an object or building located within the inspection site are not resolved, the inspected Party shall photograph the object or building as requested by the inspecting Party for the purpose of clarifying its nature and function. If the ambiguity cannot be removed during the inspection, then the question, relevant clarifications and a copy of any photographs taken shall be included in the inspection report.

13. In carrying out their activities, inspectors shall observe safety regulations established at the inspection site, including those for the protection of controlled environments
within a facility and for personal safety. Individual protective clothing and equipment shall be provided by the inspected Party, as necessary.

14. For inspections pursuant to paragraphs 3, 4, 5, 7 or 8 of Article XI of the Treaty, pre-inspection procedures, including briefings and safety-related activities, shall begin upon arrival of the inspection team at the inspection site and shall be completed within one hour. The inspection team shall begin the inspection immediately upon completion of the pre-inspection procedures. The period of inspection shall not exceed 24 hours, except for inspections pursuant to paragraphs 6, 7 or 8 of Article XI of the Treaty. The period of inspection may be extended, by agreement with the in-country escort, by no more than eight hours. Post-inspection procedures, which include completing the inspection report in accordance with the provisions of Section XI of this Protocol, shall begin immediately upon completion of the inspection and shall be completed at the inspection site within four hours.

15. An inspection team conducting an inspection pursuant to Article XI of the Treaty shall include no more than ten inspectors, except for an inspection team conducting an inspection pursuant to paragraphs 7 or 8 of that Article, which shall include no more than 20 inspectors and an inspection team conducting inspection activities pursuant to paragraph 6 of that Article, which shall include no more than 30 inspectors. At least two inspectors on each team must speak the language of the inspected Party. An

inspection team shall operate under the direction of the team leader and deputy team leader. Upon arrival at the inspection site, the inspection team may divide itself into subgroups consisting of no fewer than two inspectors each. There shall be no more than one inspection team at an inspection site at any one time.

16. Except in the case of inspections conducted pursuant to paragraphs 3, 4, 7 or 8 of Article XI of the Treaty, upon completion of the post-inspection procedures, the inspection team shall return promptly to the point of entry from which it commenced inspection activities and shall then leave, within 24 hours, the territory of the country in which the inspection site is located, using its own airplane. In the case of inspections conducted pursuant to paragraphs 3, 4, 7 or 8 of Article XI of the Treaty, if the inspection team intends to conduct another inspection it shall either:

(a) notify the inspected Party of its intent upon return to the point of entry; or

(b) notify the inspected Party of the type of inspection and the inspection site upon completion of the post-inspection procedures. In this case it shall be the responsibility of the inspected Party to ensure that the inspection team reaches the next inspection site without unjustified delay. The inspected Party shall determine the means of transportation and route involved in such travel.

With respect to subparagraph (a), the procedures set forth in paragraph 7 of Section V of this Protocol and paragraphs 1 and 2 of Section VII of this Protocol shall apply.

VII. Inspections Conducted Pursuant to Paragraphs 3, 4 or 5 of Article XI of the Treaty

1. Within one hour after the time for the specification of the inspection site notified pursuant to paragraph 1(a) of Section IV of this Protocol, the inspected Party shall implement pre-inspection movement restrictions at the inspection site, which shall remain in effect until the inspection team arrives at the inspection site. During the period that pre-inspection movement restrictions are in effect, missiles, stages of such missiles, launchers or support equipment subject to the Treaty shall not be removed from the inspection site.

2. The inspected Party shall transport the inspection team from the point of entry to the inspection site so that the inspection team arrives at the inspection site no later than nine hours after the time for the specification of the inspection site notified pursuant to paragraph 1(a) of Section IV of this Protocol.

3. In the event that an inspection is conducted in a basing country, the aircrew of the inspected Party may include representatives of the basing country.

4. Neither Party shall conduct more than one inspection pursuant to paragraph 5(a) of Article XI of the Treaty at any one time, more than one inspection pursuant to paragraph 5(b) of Article XI of the Treaty at any one time, or more than 10 inspections pursuant to paragraph 3 of Article XI of the Treaty at any one time.

5. The boundaries of the inspection site at the facility to be inspected shall be the boundaries of that facility set forth in the Memorandum of Understanding.

6. Except in the case of an inspection conducted pursuant to paragraphs 4 or 5(b) of Article XI of the Treaty, upon arrival of the inspection team at the inspection site, the in-country escort shall inform the inspection team leader of the number of missiles, stages of missiles, launchers, support structures and support equipment at the site that are subject to the Treaty and provide the inspection team leader with a diagram of the inspection site indicating the location of these missiles, stages of missiles, launchers, support structures and support equipment at the inspection site.

7. Subject to the procedures of paragraphs 8 through 14 of this Section, inspectors shall have the right to inspect the entire inspection site, including the interior of structures, containers or vehicles, or including covered objects, whose dimensions are equal to or greater than the dimensions specified in Section VI of the Memorandum of Understanding for the missiles, stages of such missiles, launchers or support equipment of the inspected Party.

8. A missile, a stage of such a missile or a launcher subject to the Treaty shall be subject to inspection only by external visual observation, including measuring, as necessary, the dimensions of such a missile, stage of such a missile or launcher. A container that the inspected Party declares to contain a missile or stage of a missile subject to the Treaty, and which is not sufficiently large to be capable of containing more than one missile or stage of such a missile of the inspected Party subject to the Treaty, shall be subject to inspection only by external visual observation, including measuring, as necessary, the dimensions of such a container to confirm that it cannot contain more than one missile or stage of such a missile of the inspected Party subject to the Treaty. Except as provided for in paragraph 14 of this Section, a container that is sufficiently large to contain a missile or stage of such a missile of the inspected Party subject to the Treaty that the inspected Party declares not to contain a missile or stage of such a missile subject to the Treaty shall be subject to inspection only by means of weighing or visual observation of the interior of the container, as necessary, to confirm that it does not, in fact, contain a missile or stage of such a missile of the inspected Party subject to the Treaty. If such a container is a launch canister associated with a type of missile not subject to the Treaty, and declared by the inspected Party to contain such a missile, it shall be subject to external inspection only, including use of radiation detection devices, visual observation and linear measurement, as necessary, of the dimensions of such a canister.

9. A structure or container that is not sufficiently large to contain a missile, stage of such a missile or launcher of the inspected Party subject to the Treaty shall be subject to inspection only by external visual observation including measuring, as necessary, the dimensions of such a structure or container to confirm that it is not sufficiently large to be capable of containing a missile, stage of such a missile or launcher of the inspected Party subject to the Treaty.

10. Within a structure, a space which is sufficiently large to contain a missile, stage of such a missile or launcher of the inspected Party subject to the Treaty, but which is demonstrated to the satisfaction of the inspection team not to be accessible by the smallest missile, stage of a missile or launcher of the inspected Party subject to the Treaty shall not be subject to further inspection. If the inspected Party demonstrates to the satisfaction of the inspection team by means of a visual inspection of the interior of an enclosed space from its entrance that the enclosed space does not contain any missile, stage of such a missile or launcher of the inspected Party subject to the Treaty, such an enclosed space shall not be subject to further inspection.

11. The inspection team shall be permitted to patrol the perimeter of the inspection site and station inspectors at the exits of the site for the duration of the inspection.

12. The inspection team shall be permitted to inspect any vehicle capable of carrying missiles, stages of such missiles, launchers or support equipment of the inspected Party subject to the Treaty at any time during the course of an inspection and no such vehicle shall leave the inspection site during the course of the inspection until inspected at site exits by the inspection team.

13. Prior to inspection of a building within the inspection site, the inspection team may station subgroups at the exits of the building that are large enough to permit passage of any missile, stage of such a missile, launcher or support equipment of the inspected Party subject to the Treaty. During the time that the building is being inspected, no vehicle or object capable of containing any missile, stage of such a missile, launcher or support equipment of the inspected Party subject to the Treaty shall be permitted to leave the building until inspected.

14. During an inspection conducted pursuant to paragraph 5(b) of Article XI of the Treaty, it shall be the responsibility of the inspected Party to demonstrate that a shrouded or environmentally protected object which is equal to or larger than the smallest missile, stage of a missile or launcher of the inspected Party subject to the Treaty is not, in fact, a missile, stage of such a missile or launcher of the inspected Party subject to the Treaty. This may be accomplished by partial removal of the shroud or environmental protection cover, measuring, or weighing the covered object or by other methods. If the inspected Party satisfies the inspection team by its demonstration that the object is not a missile, stage of such a missile or launcher of the inspected Party subject to the Treaty, then there shall be no further inspection of that object. If the container is a launch canister associated with a type of missile not subject to the Treaty, and declared by the inspected Party to contain such a missile, then it shall be subject to external inspection only, including use of radiation detection devices, visual observation and linear measurement, as necessary, of the dimensions of such a canister.

VIII. Inspections Conducted Pursuant to Paragraphs 7 or 8 of Article XI of the Treaty

1. Inspections of the process of elimination of items of missile systems specified in the Protocol on Elimination carried out pursuant to paragraph 7 of Article XI of the Treaty shall be conducted in accordance with the procedures set forth in this paragraph and the Protocol on Elimination.

(a) Upon arrival at the elimination facility, inspectors shall be provided with a schedule of elimination activities.

(b) Inspectors shall check the data which are specified in the notification provided by the inspected Party regarding the number and type of items of missile systems to be eliminated against the number and type of such items which are at the elimination facility prior to the initiation of the elimination procedures.

(c) Subject to paragraphs 3 and 11 of Section VI of this Protocol, inspectors shall observe the execution of the specific procedures for the elimination of the items of missile systems as provided for in the Protocol on Elimination. If any deviations from the agreed elimination procedures are found,

the inspectors shall have the right to call the attention of the in-country escort to the need for strict compliance with the above-mentioned procedures. The completion of such procedures shall be confirmed in accordance with the procedures specified in the Protocol on Elimination.

(d) During the elimination of missiles by means of launching, the inspectors shall have the right to ascertain by visual observation that a missile prepared for launch is a missile of the type subject to elimination. The inspectors shall also be allowed to observe such a missile from a safe location specified by the inspected Party until the completion of its launch. During the inspection of a series of launches for the elimination of missiles by means of launching, the inspected Party shall determine the means of transport and route for the transportion of inspectors between inspection sites.

2. Inspections of the elimination of items of missile systems specified in the Protocol on Elimination carried out pursuant to paragraph 8 of Article XI of the Treaty shall be conducted in accordance with the procedures set forth in Sections II, IV or V of the Protocol on Elimination or as otherwise agreed by the Parties.

IX. Inspection Activities Conducted Pursuant to Paragraph 6 of Article XI of the Treaty

1. The inspected Party shall maintain an agreed perimeter around the periphery of the inspection site and shall designate a portal with not more than one rail line and one road which shall be within 50 meters of each other. All vehicles which can contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party shall exit only through this portal.

2. For the purposes of this Section, the provisions of paragraph 10 of Article VII of the Treaty shall be applied to intermediate-range GLBMs of the inspected Party and the longest stage of such GLBMs.

3. There shall not be more than two other exits from the inspection site. Such exits shall be monitored by appropriate sensors. The perimeter of and exits from the inspection site may be monitored as provided for by paragraph 11 of Section VII of this Protocol.

4. The inspecting Party shall have the right to establish continuous monitoring systems at the portal specified in paragraph 1 of this Section and appropriate sensors at the exits specified in paragraph 3 of this Section and carry out necessary engineering surveys, construction, repair and replacement of monitoring systems.

5. The inspected Party shall, at the request of and at the expense of the inspecting Party, provide the following:

(a) all necessary utilities for the construction and operation of the monitoring systems, including electrical power, water, fuel, heating and sewage;

(b) basic construction materials including concrete and lumber;

(c) the site preparation necessary to accommodate the installation of continuously operating systems for monitoring the portal specified in paragraph 1 of this Section, appropriate sensors for other exits specified in paragraph 3 of this Section and the center for collecting data obtained during inspections.

Such preparation may include ground excavation, laying of concrete foundations, trenching between equipment locations and utility connections;

(d) transportation for necessary installation tools, materials and equipment from the point of entry to the inspection site; and

(e) a minimum of two telephone lines and, as necessary, high frequency radio equipment capable of allowing direct communication with the embassy of the inspecting Party in the country in which the site is located.

6. Outside the perimeter of the inspection site, the inspecting Party shall have the right to:

(a) build no more than three buildings with a total floor space of not more than 150 square meters for a data center and inspection team headquarters, and one additional building with floor space not to exceed 500 square meters for the storage of supplies and equipment;

(b) install systems to monitor the exits to include weight sensors, vehicle sensors, surveillance systems and vehicle dimensional measuring equipment;

(c) install at the portal specified in paragraph 1 of this Section equipment for measuring the length and diameter of missile stages contained inside of launch canisters or shipping containers;

(d) install at the portal specified in paragraph 1 of this Section non-damaging image producing equipment for imaging the contents of launch canisters or shipping containers declared to contain missiles or missile stages as provided for in paragraph 11 of this Section;

(e) install a primary and back-up power source; and

(f) use, as necessary, data authentication devices.

7. During the installation or operation of the monitoring systems, the inspecting Party shall not deny the inspected Party access to any existing structures or security systems. The inspecting Party shall not take any actions with respect to such structures without consent of the inspected Party. If the Parties agree that such structures are to be rebuilt or demolished, either partially or completely, the inspecting Party shall provide the necessary compensation.

8. The inspected Party shall not interfere with the installed equipment or restrict the access of the inspection team to such equipment.

9. The inspecting Party shall have the right to use its own two-way systems of radio communication between inspectors patrolling the perimeter and the data collection center. Such systems shall conform to power and frequency restrictions established on the territory of the inspected Party.

10. Aircraft shall not be permitted to land within the perimeter of the monitored site except for emergencies at the site and with prior notification to the inspection team.

11. Any shipment exiting through the portal specified in paragraph 1 of this Section which is large enough and heavy enough to contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected

Party shall be declared by the inspected Party to the inspection team before the shipment arrives at the portal. The declaration shall state whether such a shipment contains a missile or missile stage as large or larger than and as heavy or heavier than an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party.

12. The inspection team shall have the right to weigh and measure the dimensions of any vehicle, including railcars, exiting the site to ascertain whether it is large enough and heavy enough to contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party. These measurements shall be performed so as to minimize the delay of vehicles exiting the site. Vehicles that are either not large enough or not heavy enough to contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party shall not be subject to further inspection.

13. Vehicles exiting through the portal specified in paragraph 1 of this Section that are large enough and heavy enough to contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party but that are declared not to contain a missile or missile stage as large or larger than and as heavy or heavier than an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party shall be subject to the following procedures.

(a) The inspecting Party shall have the right to inspect the interior of all such vehicles.

(b) If the inspecting Party can determine by visual observation or dimensional measurement that, inside a particular vehicle, there are no containers or shrouded objects large enough to be or to contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party, then that vehicle shall not be subject to further inspection.

(c) If inside a vehicle there are one or more containers or shrouded objects large enough to be or to contain an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party, it shall be the responsibility of the inspected Party to demonstrate that such containers or shrouded objects are not and do not contain intermediate-range GLBMs or the longest stages of such GLBMs of the inspected Party.

14. Vehicles exiting through the portal specified in paragraph 1 of this Section that are declared to contain a missile or missile stage as large or larger than and as heavy or heavier than an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party shall be subject to the following procedures.

(a) The inspecting Party shall preserve the integrity of the inspected missile or stage of a missile.

(b) Measuring equipment shall be placed only outside of the launch canister or shipping container; all measurements shall be made by the inspecting Party using the equipment provided for in paragraph 6 of this Section. Such measurements shall be observed and certified by the in-country escort.

(c) The inspecting Party shall have the right to weigh and measure the dimensions of any launch canister or of any shipping container declared to contain such a missile or missile stage and to image the contents of any launch canister or of any shipping container declared to contain such a missile or

[illegible] shall have the right to view such structures or [illegible] equipment or launch vehicles or shipping containers [illegible] and calendar year. The declaration should be provided during all phases of such viewings. During such inspection viewings:

(i) the front end of the launch vehicle or the cover of the shipping container shall be opened;

(ii) the missile or missile stage shall not be removed from the launch vehicle or shipping container; and

(iii) the length and diameter of the stages of the missile shall be measured in accordance with the methods agreed by the Parties so as to ascertain that the missile or missile stage is not an intermediate-range [illegible] of the inspected Party, or the longest stage of such a [illegible] and that the missile has no more than one stage which is currently oriented to a stage of an existing type of intermediate-range [illegible].

(iv) The inspecting Party shall also have the right to inspect and photograph [illegible] the [illegible] including the [illegible] constructing such a missile or missile stage in accordance with the procedures in paragraph 13 of this Section.

9. Completion of Inspection

An inspection shall be completed if, due to circumstances brought about by force majeure, it cannot be carried out. In the case of a delay that prevents an inspection team performing an inspection pursuant to paragraphs 1, 2 or 3 of Article IX of the Treaty, from arriving at the inspection site during the time specified in paragraph 1 of Section VII of this Protocol, the inspecting Party may without cancel or carry out the inspection. If an inspection is cancelled due to circumstances brought about by force majeure or delay, then the number of inspections to which the inspecting Party is entitled shall not be reduced.

10. Inspection Report

1. For inspections conducted pursuant to paragraphs 1, 2, 3, 7 or 8 of Article IX of the Treaty, during post-inspection procedures, and in no case more than seven days after the inspection has been completed, the inspection team leader shall provide the in-country agency with a written inspection report in both the English and Russian languages. The report shall be factual. It shall include the type of inspection carried out, the numbers of aircraft, stages of missiles, launchers and items of support equipment subject to the Treaty observed during the period of inspection and any measurements recorded pursuant to paragraph 12 of Section IV of this Protocol. Photographs taken during the inspection in accordance with agreed procedures, as well as the inspection site diagram provided for in paragraph 4 of Section VIII of this Protocol, shall be attached to this report.

2. For inspections activities conducted pursuant to paragraph 4 of Article IX of the Treaty, within 3 days after the end of each month, the inspection team leader shall provide the in-country agency with a written inspection report both in the English and Russian languages. The report shall be factual. It shall include the numbers of launchers declared to contain a missile or stage of a missile or [illegible] that can be based on Western [illegible] intermediate-range [illegible] stage of such a

GLBM of the inspected Party that left the inspection site through the portal specified in paragraph 1 of Section IX of this Protocol during that month. The report shall also include any measurements of launch canisters or shipping containers contained in these vehicles recorded pursuant to paragraph 11 of Section VI of this Protocol. In the event the inspecting Party, under the provisions of paragraph 14(c) of Section IX of this Protocol, has viewed the interior of a launch canister or shipping container declared to contain a missile or stage of a missile as large or larger than and as heavy or heavier than an intermediate-range GLBM or longest stage of such a GLBM of the inspected Party, the report shall also include the measurements of the length and diameter of missile stages obtained during the inspection and recorded pursuant to paragraph 11 of Section VI of this Protocol. Photographs taken during the inspection in accordance with agreed procedures shall be attached to this report.

3. The inspected Party shall have the right to include written comments in the report.

4. The Parties shall, when possible, resolve ambiguities regarding factual information contained in the inspection report. Relevant clarifications shall be recorded in the report. The report shall be signed by the inspection team leader and by one of the members of the in-country escort. Each Party shall retain one copy of the report.

This Protocol is an integral part of the Treaty. It shall enter into force on the date of entry into force of the Treaty and shall remain in force as long as the Treaty remains in force. As provided for in paragraph 1(b) of Article XIII of the Treaty, the Parties may agree upon such measures as may be necessary to improve the viability and effectiveness of this Protocol. Such measures shall not be deemed amendments to the Treaty.

DONE at Washington on December 8, 1987, in two copies, each in the English and Russian languages, both texts being equally authentic.

FOR THE UNITED STATES OF AMERICA:

President of the United States of America

FOR THE UNION OF SOVIET SOCIALIST REPUBLICS:

General Secretary of the Central Committee of the CPSU

Annex
Provisions on Privileges and Immunities of Inspectors and Aircrew Members

In order to exercise their functions effectively, for the purpose of implementing the Treaty and not for their personal benefit, the inspectors and aircrew members referred to in Section III of this Protocol shall be accorded the privileges and immunities contained in this Annex. Privileges and immunities shall be accorded for the entire in-country period in the country in which an inspection site is located, and thereafter with respect to acts previously performed in the exercise of official functions as an inspector or aircrew member.

1. Inspectors and aircrew members shall be accorded the inviolability enjoyed by diplomatic agents pursuant to Article 29 of the Vienna Convention on Diplomatic Relations of April 18, 1961.

2. The living quarters and office premises occupied by an inspector carrying out inspection activities pursuant to paragraph 6 of Article XI of the Treaty shall be accorded the inviolability and protection accorded the premises of diplomatic agents pursuant to Article 30 of the Vienna Convention on Diplomatic Relations.

3. The papers and correspondence of inspectors and aircrew members shall enjoy the inviolability accorded to the papers and correspondence of diplomatic agents pursuant to Article 30 of the Vienna Convention on Diplomatic Relations. In addition, the aircraft of the inspection team shall be inviolable.

4. Inspectors and aircrew members shall be accorded the immunities accorded diplomatic agents pursuant to paragraphs 1, 2 and 3 of Article 31 of the Vienna Convention on Diplomatic Relations. The immunity from jurisdiction of an inspector or an aircrew member may be waived by the inspecting Party in those cases when it is of the opinion that immunity would impede the course of justice and that it can be waived without prejudice to the implementation of the provisions of the Treaty. Waiver must always be express.

5. Inspectors carrying out inspection activities pursuant to paragraph 6 of Article XI of the Treaty shall be accorded the exemption from dues and taxes accorded to diplomatic agents pursuant to Article 34 of the Vienna Convention on Diplomatic Relations.

6. Inspectors and aircrew members of a Party shall be permitted to bring into the territory of the other Party or a basing country in which an inspection site is located, without payment of any customs duties or related charges, articles for their personal use, with the exception of articles the import or export of which is prohibited by law or controlled by quarantine regulations.

7. An inspector or aircrew member shall not engage in any professional or commercial activity for personal profit on the territory of the inspected Party or that of the basing countries.

8. If the inspected Party considers that there has been an abuse of privileges and immunities specified in this Annex, consultations shall be held between the Parties to determine whether such an abuse has occurred and, if so determined, to prevent a repetition of such an abuse.

B. REPORT FROM THE PRESIDENT OF THE UNITED STATES, PURSUANT TO SECTION 52 OF THE ARMS CONTROL AND DISARMAMENT ACT OF 1961, AS AMENDED, ENTITLED: "ADHERENCE TO AND COMPLIANCE WITH AGREEMENTS"

THE WHITE HOUSE

WASHINGTON

MAR 16 1988

March 15, 1988

Dear Mr. Chairman:

I am pleased to transmit the enclosed report on the adherence of the United States to obligations undertaken in arms control agreements and on problems related to compliance by other nations with the provisions of bilateral and multilateral arms control agreements to which the United States is a party.

This report, updating last year's report, meets the requirements of Section 52 of the Arms Control and Disarmament Act, as amended in the FY 1988-1989 ACDA Authorization Bill. It was prepared by the Director of the U.S. Arms Control and Disarmament Agency in coordination with the Secretary of State, the Secretary of Defense, the Secretary of Energy, the Chairman of the Joint Chiefs of Staff, and the Director of Central Intelligence.

In previous reports to the Congress, the United States has made clear its concerns about Soviet noncompliance. These concerns remain. The United States Government takes equally seriously its own commitments to arms control agreements and sets rigid standards and procedures for assuring that it meets its obligations. The United States has been and remains in compliance with all current treaty obligations and political commitments.

This report is unclassified and suitable for general release. However, a classified attachment, providing information on noncompliance by other nations with provisions of multilateral arms control agreements, is being provided under separate cover.

Sincerely,

Ronald Reagan

The Honorable Claiborne Pell
Chairman
Committee on Foreign Relations
United States Senate
Washington, D. C. 20510

I. U.S. COMPLIANCE WITH ARMS CONTROL AGREEMENTS

a. Effective arms control requires that Parties comply fully with the arms control obligations and commitments they have undertaken. Compliance is a cornerstone of international law. The U.S. approach to compliance is deeply rooted in our own legal system and a set of fundamental principles and values which govern American attitudes toward both arms control and international obligations. Our deep-seated legal tradition, a commitment to arms control agreements that can enhance our security and that of our allies, and our open society are basic and enduring factors. They create powerful incentives to comply with agreements to control nuclear and other weapons. Legal and institutional procedures to ensure compliance have been established, and they reflect the seriousness with which these obligations are taken and reinforce these underlying principles. Attachment 1 details these procedures.

b. Pursuant to Section 36 of the Arms Control and Disarmament Act, ACDA provides on a yearly basis a description of all major DOD programs and an analysis of the arms control implications of each program. Reference Fiscal Year 1988 Arms Control Impact Statements, June 1987.

c. In recent years the Soviet Union has raised a number of compliance charges against the United States. Some of these charges date back over several years, while others have been raised in the past year. There has been a clear attempt on the Soviet Union's part to invent counter-charges in response to legitimate U.S. concerns regarding Soviet noncompliance. In all cases, once the issue was clearly defined, the U.S. Government has provided full responses that should have removed any doubt that the U.S. was and remains in compliance with all treaty obligations and political commitments.

On January 1, 1987, the Accord reached at the Stockholm Conference on Confidence- and Security-building Measures went into effect. The Accord contains new standards for notification, observation, and verification of military activities, including on-site inspection. The provisions of the Helsinki Final Act that relate to military security and confidence-building have been superseded by the Stockholm Document. For this reason and because there have been no allegations of U.S. noncompliance related to the Helsinki Final Act in 1987, the Helsinki Final Act is not treated in this report although the Stockholm document is. Further, Soviet charges during 1987 related to chemical weapons addressed no U.S. obligations undertaken in arms control agreements but rather addressed only U.S. negotiating positions in the Conference on Disarmament. Therefore, these allegations are not considered under the requirements of this report.

Attachment 2 details each Soviet allegation of U.S. noncompliance and provides the facts of U.S. compliance.

II. Other Nations' Compliance with Arms Control Agreements

a. The President's December 1987 Report to Congress on Soviet Noncompliance with Arms Control Agreements, covering the period March to December 1987, details the significant issues involving Soviet noncompliance.

Specific third-country actions for the last seven years inconsistent with their obligations under the 1972 Biological and Toxin Weapons Convention and the 1925 Geneva Protocol on

Chemical Weapons are outlined in Attachment 3, a classified report provided under separate cover. The United States concluded in 1984 and subsequently that Iraq has used chemical weapons in its war with Iran. The United States has made several demarches since 1983 to the Iraqi government, attempting to dissuade Iraq from further use of these weapons. The United States also sought the cooperation of allies and friends in this effort. In March 1984, the United States issued the first of several public statements strongly condemning illegal CW use and pointing out there can be no justification for first use of such weaponry by any country.

In 1984, the United States imposed foreign policy export controls on certain chemicals useful in the production of chemical weapons to deny their export to Iran and Iraq in order to inhibit the further production and use of chemical weapons by these countries. In 1986, the United States extended these controls to include Syria, and in 1987 expanded the list of chemicals subject to control. Similar controls have since been implemented to varying degrees by 18 other Western nations.

The United States has been in the forefront of international efforts to halt the proliferation and use of chemical weapons. In addition to the imposition of export controls described above, the United States actively participates in informal consultations on CW use and proliferation led by Australia and met with the Soviet Union twice in 1986 and once in 1987 to discuss the prevention of chemical weapons proliferation.

Since early 1985, the United States has been making demarches to governments whose commercial firms have been determined by the United States to be actually or potentially involved in Gulf War belligerents' and their allies' efforts to procure chemicals for use in manufacturing chemical weapons.

The United States continues to support efforts in the United Nations to condemn the use of chemical weapons wherever and whenever it occurs and to conduct investigations of use. In 1987, the United States and Australia both introduced resolutions to this end with special emphasis on broadening support for the role of the Secretary General in investigations of CW use; other points concerned curbing the spread of CW and condemnation of CW use. In the spirit of stemming the proliferation of resolutions, the two texts were merged and subsequently accorded consensus by the United Nations General Assembly. The General Assembly also adopted by consensus a United States resolution regarding compliance with arms control agreements.

b. The President's December 1987 Report to Congress on Soviet Noncompliance briefly addresses the U.S. assessment of possible Soviet gains from each of the major issues addressed. The annual DoD publication Soviet Military Power also provides DoD's assessment of the impact of Soviet actions.

c. Steps to redress any damage to United States national security and to reduce compliance problems have been discussed in a White House Fact Sheet of May 27, 1986; the White House message to the Congress of June 3, 1986, on strategic modernization (pp. 5- 6); and the ICBM Modernization Program: Annual Progress Report to the Committees on Armed Services of the Senate and House of Representatives, May 1987 (Classified).

d. An amendment to Section 52 of the Arms Control and Disarmament Act expands the requirements of this report to include information on "actions taken by the Soviet Union and other nations with regard to the size, structure, and

disposition of military forces in order to comply with such arms control agreements." Nations take a variety of actions with regard to their military forces for a variety of reasons, only one of which may be to comply with arms control agreements. For example, older or obsolete systems may be retired from the inventory for reasons of cost effectiveness. During the past year, however, the Soviet Union has provided no notifications with regard to its strategic offensive or defensive forces that would indicate an action taken to bring the USSR into compliance with existing arms control agreements. Under the Stockholm Document, the Soviet Union and other nations have provided notification of exercises and invited observers, but we cannot speculate as to whether these exercises were designed to demonstrate changes in the size, structure, and disposition of military forces made strictly in order to remain in compliance with the new agreement. Under the terms of the INF Treaty, numerous changes are to be made in the size and disposition of U.S. and Soviet intermediate-range nuclear forces. Assessments of these actions cannot be made until after the Treaty enters into force.

Attachment 1

UNITED STATES COMPLIANCE WITH ARMS CONTROL AGREEMENTS

There are three major U.S. institutional and legal procedures for ensuring that U.S. plans and programs remain consistent with its international obligations. These procedures include internal Department of Defense controls, separate evaluations produced by the U.S. Arms Control and Disarmament Agency, and Congressional oversight.

In 1972, by direction of the President, the Department of Defense (DoD) established a process to ensure that all DoD programs complied with U.S. international obligations undertaken in the Strategic Arms Limitation Agreements.[1] Responsibility for monitoring and ensuring U.S. compliance was assigned to the Under Secretary of Defense for Acquisition (USD(A)). These responsibilities include: a) reviewing quarterly reports from each of the U.S. Armed Services and designated DoD agencies; b) submitting timely reports on compliance to the Secretary of Defense; c) providing general instructions and procedures as well as specific guidance as needed; and d) conducting and directing inspections.[2] The DoD General Counsel provides advice and assistance with respect to implementation of the compliance process and interpretation of arms control agreements.

The implementation of the process rests with the Services and Defense Agencies which must certify quarterly to the USD(A) that their programs comply with all U.S. international obligations and must establish internal procedures and offices to monitor and ensure internal compliance. This process is facilitated by a DoD Compliance Review Group, chaired by USD(A) with

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[1] Department of Defense Directive 5100.70, 9 January 1973, Implementation of Strategic Arms Limitation (SAL) Agreements, as amended by a SecDef memorandum of December 22, 1986, which rescinded those portions pertaining to observance of the Interim Agreement on Strategic Offensive Arms and the SALT II Treaty.

[2] Department of Defense Instruction S-5100.72 establishes general instructions, guidelines, and procedures for ensuring the continued compliance of all DoD programs with existing agreements, as amended by a SecDef memorandum of December 22, 1986, which rescinded those portions pertaining to observance of the Interim Agreement on Strategic Offensive Arms and the SALT II Treaty.

Representatives from DoD General Counsel, the Under Secretary of Defense for Policy, and the JCS, which reviews U.S. programs with respect to compliance issues, prepares related reports, and responds to ad hoc compliance matters as they arise.

Separate from and independent of the above DoD process, other procedures and mechanisms are in place to monitor U.S. compliance with international obligations. An independent evaluation of all DoD program elements meeting certain Congressionally-mandated criteria[3] is performed on an annual basis to determine whether these U.S. programs may have any impact on existing arms control obligations or on the arms control process itself. This evaluation is conducted by an interagency group chaired by the U.S. Arms Control and Disarmament Agency and is reported to the Congress in the annual Arms Control Impact Statement (ACIS) submitted at the same time as the President's budget request.

The interagency-approved ACIS provides annual documentation of the effects of U.S. defense programs on arms control and is provided to the Congress in both classified and unclassified versions. The unclassified version is subsequently published alternately by the House Committee on Foreign Affairs and the Senate Foreign Relations Committee and is available to the public through the Government Printing Office.

Finally, the Congress may direct specific reports from the Executive Branch. These reports may involve specific programs, such as the one-time March 1984 Report to the Congress on U.S. Policy on ASAT Arms Control covering anti-satellite systems and the annual Report to Congress on the Strategic Defense Initiative, or it may be general, such as the annual report specifying the steps the U.S. has taken to ensure compliance with existing arms control agreements.

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[3] Section 36, Arms Control Impact Information and Analysis, added to the Arms Control and Disarmament Act by Section 146 of Public Law 94-141 (22 U.S.C. 2576).

Attachment 2

SOVIET CHARGES OF U.S. NONCOMPLIANCE

The Soviet Union has in recent years raised a number of charges of noncompliance against the United States. Some of these charges date back over several years, while others have been raised in the past year. There has been a clear attempt on the Soviet Union's part to invent counter-charges in response to legitimate U.S. compliance issues. In all cases, once the issue was clearly defined, the U.S. Government has provided full responses that should have removed any doubt that the U.S. was and remains in compliance with all treaty obligations and political commitments.

ABM TREATY ISSUES

ABM Treaty: Strategic Defense Initiative

Soviet Allegation: Territorial Defense

The Soviet Union has asserted that the Strategic Defense Initiative is a program to establish an anti-ballistic missile (ABM) defense of the territory of the United States and its NATO

allies which will include space-based elements and is inconsistent with the prohibition in the ABM Treaty against providing the base for a territorial defense of the country and the Article V provision not "to develop, test, or deploy ABM systems or components which are sea-based, air-based, space-based, or mobile land-based." During 1987 the Soviet Union stated that the goal of the U.S. SDI program -- which they claim to be the development and deployment of a large-scale ABM defense of the U.S. territory with space-based components -- is contrary to Article I.2 of the ABM Treaty. They also have said that practically every step toward implementation of the SDI program would be a step toward rejecting the ABM Treaty.

The Facts:

These Soviet assertions are false. The Strategic Defense Initiative is a research and technology development program. Hence, it alone could not possibly constitute a base for a deployed ABM system for a defense of the territory of a country. The Soviets also know that such research is allowed and willingly acknowledged it when, in a major statement before the Soviet Presidium in 1972, then Soviet Defense Minister Grechko stated that the ABM Treaty "...places no limitations whatsoever on the conducting of research and experimental work directed toward solving the problem of defending the country from nuclear missile strike." On November 30, 1987, Soviet General Secretary Gorbachev stated in an interview on U.S. television, "Practically, the Soviet Union is doing all that the United States is doing, and I guess we are engaged in research, basic research, which relates to these aspects which are covered by the SDI of the United States."

The SDI is exploring promising new technologies and will permit informed policy decisions as early as possible regarding possible future deployment options which meet our criteria. Under Presidential direction the overall SDI program is under constant review to ensure that all efforts on SDI will be fully consistent with our international legal obligations, including the ABM Treaty.

Soviet Allegation: Treaty Interpretation

The Soviet Union has asserted that President Reagan's October 1985 determination that the broad interpretation of the ABM Treaty is fully justified is merely an effort to destroy the ABM Treaty. According to the Soviets, both Parties specifically agreed in 1972 to the so-called restrictive interpretation. Specifically, the Soviets have said that the U.S. reading of Agreed Statement "D" as "permitting unlimited development, or even deployment, of ABM systems 'based on new physical principles' (lasers, particle beams, etc.,) is contrary to its meaning," and they have argued that such an interpretation ignores Article V.

The Facts:
Since the President's October 1985 determination that the broad interpretation is fully justified, the Soviets have undertaken a propaganda and disinformation campaign aimed at discrediting that determination and, more generally, killing or crippling the SDI program through their various arms control proposals. Indeed, the Soviet position with respect to the ABM Treaty interpretation is disingenuous. Both sides know that, despite the best efforts of U.S. negotiators in 1972, the Soviets simply refused to agree to a ban on the development and testing of unknown ABM systems including mobile, based on "other physical principles." The argument that the sides agreed to such limitations is clearly refuted by the negotiating record.

Soviet Allegation: Extension of the SDI to Europe

The Soviets charged that the modernized Patriot and Improved Hawk antiaircraft missile complexes and airborne and space-based detection, tracking, and guidance facilities form the basis of defense systems being created. The Soviets stated that the term "European Defense Initiative" was being avoided. They alleged that this activity is a "patent circumvention" of the ABM Treaty.

The Facts:

The U.S., along with its European allies, is replacing obsolete antiaircraft missile systems with modern ones. In addition, the U.S. has a program to provide the Patriot antiaircraft missile system with an anti-tactical ballistic missile capability, which is permitted by the ABM Treaty. All SDI research agreements with third parties have been and will be implemented in a manner consistent with U.S. international obligations, including the ABM Treaty. The USG has adopted guidelines to ensure that all exchanges of data and research activities are conducted in full compliance with ABM Treaty obligations not to transfer to other states ABM systems or components limited by the Treaty, nor to provide technical descriptions or blue prints specially worked out for the construction of such systems or components.

ABM Treaty: SDI-related Tests

The Soviets have raised questions about several tests conducted under the SDI program. They have not charged that these experiments are violations of the ABM Treaty but they have made general statements that imply questionable conduct. They have asked how a Party can strictly comply with the provisions of the ABM Treaty if, contrary to Article V, a Party conducts experiments in the areas of space-based defenses.

Soviet Allegation: Laser Tests

The Soviet Union has questioned how experiments involving laser devices under SDI programs conform to the provisions of the ABM Treaty, in particular, the provisions of Article V prohibiting the development, testing, and deployment of ABM systems and components that are space-based. Specific references have been made to laser beams aimed at mirrors on a space shuttle and on a missile during the early portion of the missile's flight, and to a test at White Sands Missile Test Range involving a laser and a Titan ICBM second stage airframe.

The Facts:

None of the tests cited used ABM components or devices capable of substituting for ABM components. None of the experiments involved strategic ballistic missiles or their elements while in flight trajectory. These experiments were designed to test various techniques of high-precision tracking and of atmospheric compensation for lasers, or, in the case of the ground-based static test against a Titan II ICBM second stage, to provide an understanding of the effects of directed energy on structural materials.

Soviet Allegation: Space-Based Tests

The Soviet Union has charged that the creation of space-based "elements" of an ABM defense under the Strategic Defense Initiative is already directly contrary to Article V of the ABM Treaty which prohibits the "development, testing and deployment of ABM systems or components that are space-based." In particular, the Soviets charged that on September 5, 1986, the

United States conducted an experiment in the course of which, after two objects were placed in orbit by a Delta missile, missions of acquisition, inertial tracking, and targeting and destruction were carried out.

The Facts:

The ABM Treaty includes the terms "ABM system" and "ABM system components". The new Soviet term "element" does not appear in the Treaty. The Soviet charge represents an apparent attempt to expand the limitation on testing and development beyond what was agreed in 1972. In the case of the Significant Technical Milestone (STM) test, conducted in September 1986, the experiment was fully compliant with the ABM Treaty. No ABM components were used during the experiment, nor did any of the devices used have the capability to substitute for an ABM component. Neither vehicle was flying a ballistic missile trajectory. The experiment was developed so that the range, speed, orbital parameters, relative velocities, and sensor limitations precluded any possibility that the vehicles had ABM capability or that the experiment involved a test in an ABM mode. Plans for the experiment were reported in the 1986 SDIO Annual Report to Congress.

Soviet Allegation: Nuclear Tests Underground and in Space.

The Soviet Union has charged that conducting underground nuclear tests for SDI purposes at the Nevada Test Site does not correspond to the obligation under the ABM Treaty which bans testing for ABM purposes except at previously designated ABM test ranges. The designated ABM test ranges for the U.S. are Kwajalein Atoll and White Sands, New Mexico. The Soviets also stated that the SDI is engaged in the creation of lasers fed by energy from a nuclear explosion, that the siting of such explosive devices in space would violate Article IV of the 1967 Outer Space Treaty, and that conducting test explosions in space to complete work on nuclear triggered lasers is also prohibited by the 1964 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Underwater.

The Facts:

While the U.S. Government does not characterize the nature or purpose of particular underground nuclear tests, it is true that phenomenology experiments are being conducted within the SDI program to understand the applicability of nuclear directed energy concepts. Testing related to the feasibility of such concepts is in conformity with the ABM Treaty. It does not involve an ABM component (an ABM launcher, an ABM interceptor missile, or an ABM radar) or a device which could substitute for an ABM component.

While the SDI program is focused primarily on non-nuclear technologies, it is important to explore the promising concepts which use nuclear energy to power devices which could destroy ballistic missiles at great distances. Further, it is useful to study these concepts to determine the feasibility and effectiveness of similar defensive systems that an adversary may develop to use against future U.S. surveillance, defensive, or offensive systems.

In fact, the Soviets have pursued research relevant to nuclear-driven directed energy weapons and some of their research predates our own. That the Soviets are willing to incorporate nuclear technologies in their defensive systems is demonstrated by the fact that their traditional anti-ballistic missile (ABM) system around Moscow utilizes interceptors carrying nuclear warheads.

ABM Treaty: Modernization of the Thule and Fylingdales Radars

Soviet Allegation:

The Soviets claim that construction of a "new" large phased-array radar (LPAR) at Thule, Greenland, and the planned construction of a similar radar near Fylingdales, England, are contrary to Article VI and Agreed Statement "F" of the ABM Treaty. Article VI prohibits deployment in the future of radars for early warning of strategic ballistic missile attack except at locations along the periphery of a Party's national territory and oriented outward. Agreed Statement "F" prohibits the deployment of LPARs of over a certain radar potential except as provided for in Articles III, IV, and VI or for use in space track or national technical means of verification.

The Soviets have stated that the USSR has no complaints about the type of radars originally located at Thule and Fylingdales nor did they demand their dismantling when the ABM Treaty was negotiated. Their stated concern is about what they call deployment of large phased-array radars outside U.S. territory that are entirely new radars having different characteristics, principles of operation, and design features. These radars, in the Soviet opinion, are not comparable with any of the old radars located at Thule and Fylingdales but rather have increased capabilities over those radars. The Soviets have labeled the U.S. activity at Thule to be "a flagrant contravention of the provisions of the ABM Treaty which prohibits the construction of large phased-array radars outside the boundaries of national territory."

The Facts:

The restrictions on early warning radars and LPARs do not apply to the existing sites such as those at Thule and Fylingdales. Article VI, which obligates the Parties "not to deploy in the future" early warning radars except at locations along the periphery of their national territory and oriented outward, prohibits only future deployments. Neither side proposed, and the Treaty does not contain, any limitations on the modernization or replacement of permitted early warning radars. Therefore, there was no need to provide in the Treaty explicit permission for the modernization of radars that are outside the coverage of the Treaty's restrictions, i.e., those already deployed. This is consistent with the Treaty's approach of permitting even the modernization and replacement of ABM systems and components which are restricted by the Treaty.

Nor does Agreed Statement "F" prohibit modernization of the early warning radar facilities at Thule and Fylingdales with LPARs. In Agreed Statement "F," the Parties agreed not to deploy LPARs, "except as provided for in Articles III, IV, and VI of the Treaty, or except for the purposes of tracking objects in outer space or for use as national technical means of verification." Thus, the agreed statement limits LPARs to five kinds: those permitted in ABM deployment areas (Article III), those permitted at test ranges (Article IV), ballistic missile early warning radars at locations provided for in Article VI, space-tracking radars, and radars for national technical means of verification. Since the facilities at Thule and Fylingdales are for early warning and were deployed prior to signature of the Treaty, the modernization of the early warning radar facilities at these locations with an LPAR is completely consistent with Article VI and hence Agreed Statement "F" as well. Put another way, Article VI "grandfathered" the Thule and Fylingdales radar sites for BMEW purposes, not merely the specific equipment there at the time of the signing of the ABM

Treaty. Since the U.S. is only modernizing that equipment, Agreed Statement "F" does not apply.

ABM Treaty: PAVE PAWS Radars

Soviet Allegation:

The Soviets have stated that their concern regarding the deployment of a network of PAVE PAWS radars in the U.S. stems from comparing their characteristics with the U.S. Perimeter Acquisition Radar (PAR), an ABM radar. The Soviets assert that the U.S. has not responded to their concern but has merely stated that all of the PAVE PAWS radars are for early warning of ballistic missile attack (BMEW) and, as required by the Treaty, are located on the periphery of our national territory and are oriented outward. The Soviets further argue that the question that they have asked does not have to do with where and how these radars are located, but rather with the coincidence of characteristics of radars of the PAVE PAWS type with those of the PAR and the consequent capability of the PAVE PAWS radars to perform ABM functions.

The Facts:

Contrary to Soviet allegations, the U.S. PAVE PAWS radars are entirely consistent with the ABM Treaty. These are ballistic missile early warning radars, a type of radar permitted by the Treaty, and have been deployed on the U.S. periphery and oriented outward, as the Treaty requires. Soviet "concerns" over PAVE PAWS characteristics are entirely unfounded. All large phased-array radars (LPARs), such as PAVE PAWS (as well as Soviet LPARs), share some characteristics and have some inherent ABM potential, which both the U.S. and Soviets have acknowledged. While there are some similarities between some characteristics of PAVE PAWS and the Perimeter Acquisition Radar (PAR), there are also important differences, of which the Soviets are well aware. While the PAR was originally constructed and deployed as an ABM radar, the U.S. has specifically designed and deployed the PAVE PAWS radars in a configuration and at locations which optimize early warning capability rather than ABM potential, of which the Soviets are also well aware. In short, PAVE PAWS are clearly legitimate early warning radars, and Soviet assertions to the contrary are groundless.

ABM Treaty: Other Issues

Soviet Allegation: Shemya Radar

The Soviet Union has asserted that, "in clear conflict" with the ABM Treaty, the U.S. has deployed a radar on Shemya Island with ABM capabilities.

The Facts:

The U.S. activities at Shemya are not in conflict with the provisions of the Treaty. The function of the radar on Shemya Island in the Aleutians is national technical means (NTM) of verification, as its location and orientation make clear. It also has secondary missions of early warning and space track. The radar is located on the periphery of the U.S. and oriented outward. Like any large phased-array radar, it utilizes technology and some subcomponents which are applicable to phased-array radars generally (including ABM radars), but it is not an ABM radar. It is on an isolated island approximately 1,500 km from the Alaska mainland and approximately 6,200 km from the northwest portion of the contiguous 48 states, a

location that would be negligible if the radar were intended for an ABM mission.

Soviet Allegation: Mobile ABM Radar

The Soviet Union has asserted that, "in clear conflict" with the ABM Treaty, the U.S. has undertaken to develop mobile ABM radars.

The Facts:

The Soviet assertion is false. The radar in question was not an ABM radar, but rather an instrumentation radar used exclusively at the Kwajalein missile range. It was not constructed or deployed for an ABM role, nor was it ever tested in an ABM mode. As an instrumentation radar its mobility was not constrained by the ABM Treaty. Only one such radar was built, and it was dismantled after completion of the mission.

Soviet Allegation: ICBMs for ABM Purposes

The Soviet Union has asserted that, "in clear conflict" with the ABM Treaty, the U.S. is testing Minuteman ICBMs to provide them with ABM capabilities.

The Facts:

The Soviet assertion is false. Two stages of the Minuteman I ICBM, but not the whole missile, which is no longer deployed by the U.S., were used in a test as part of a research program conducted in full conformity with the ABM Treaty. The test missile in question was observably different from Minuteman I.

Soviet Allegation: Multiple-Warhead ABM Interceptor

The Soviet Union has asserted that, "in clear conflict" with the ABM Treaty, the U.S. is developing multiple warheads for ABM interceptor missiles.

The Facts:

The Soviet assertion is false. The U.S. is not developing ABM interceptors with multiple warheads and has never pursued such a program.

OTHER TREATY ISSUES

Threshold Test Ban Treaty (TTBT): the 150 Kiloton Limit

Soviet Allegation:

The Soviet Union has asserted that the U.S. has conducted, and continues to conduct, numerous nuclear weapon tests that exceed the limits established by the TTBT.

The Facts:

The Soviet assertion is false. In 1976, the Parties, by signing the TTBT, assumed an obligation not to undertake the purposes -- that is, to refrain, beginning in 1976, from testing above the 150 kiloton threshold. Since 1976, the U.S. has been in full compliance with the TTBT. This issue is also addressed, and relevant classified data are provided, in Section VIII of the Joint Report submitted pursuant to Section VIII of the Joint Authorization Bill (P.L. 100-180).

[illegible] Abstract

[illegible]

[illegible]

[illegible]

action which prevented such venting, even though the U.S. offered to make available current containment technology to prevent contamination of the environment.

In regard to the most recent allegation, we carefully investigated the allegations and found them to have no basis whatever in fact. We conducted radiation monitoring operations at NTS and in its immediate vicinity and detected no radioactivity over background levels during and subsequent to the tests.

The Stockholm Document

Soviet Allegation:

The Soviet Union stated in its inspection report of U.S. exercise "IRON FORGE," conducted in the Federal Republic of Germany (FRG) between 28-30 October 1987, that it was not able to determine unambiguously whether participation levels corresponded to the parameters given in the advance notification.

The Facts:

Soviet inspectors did not accept statements by U.S. and FRG authorities that U.S. forces conducting gunnery training at Grafenwoehr Training Area were not part of the "IRON FORGE" exercise. The FRG and U.S. responded to the Soviet report on 10 December 1987 with facts on the structural organization of the forces in question. Units in training at Grafenwoehr were part of a different Army division than the one on the "IRON FORGE" exercise and were participating in distinctly separate gunnery and maneuver training.

C. SUPPLEMENT TO THE PRESIDENT'S REPORT, ENTITLED: "ADHERENCE TO AND AND COMPLIANCE WITH AGREEMENTS

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY
Washington D.C. 20451

THE DIRECTOR

June 16, 1988

Dear Mr. Chairman:

During my testimony as Director-designate on March 18, you asked me to provide information pursuant to Section 52 of the ACDA Act on Soviet actions relative to past and present arms control agreements to which the US is a party.

Pursuant to that provision, on May 17 I sent you a classified response on Soviet actions which relate to the USSR's obligations under the ABM Treaty (Treaty Between the United States and the Soviet Union on the Limitation of Anti-Ballistic Missile Systems). An unclassified version of that response is enclosed. Material on the expired SALT I Interim Agreement and SALT II, to which the US no longer adheres, is being provided separately.

The enclosure does not judge whether the Soviets undertook these actions to comply with the ABM Treaty or for other reasons, and does not address provisions the Soviets have been in compliance with by taking no action. The President's series, "Report to Congress on Soviet Noncompliance with Arms

Control Agreements," should be considered with the enclosed in evaluating the record of Soviet arms control behavior relative to the ABM Treaty.

The material was prepared in coordination with the Department of State, the Department of Defense, the Department of Energy, the Organization of the Joint Chiefs of Staff, and the Intelligence Community.

Sincerely,

William F. Burns

Supplement to

"Adherence to and Compliance with Agreements"
(March 11, 1988)

The Treaty Between the United States and the Soviet Union on the Limitation of Anti-Ballistic Missile Systems (the ABM Treaty), as amended by the 1974 Protocol, allows the USSR to have no more than 100 ABM launchers at a single ABM deployment area. The Soviets initially constructed 64 above-ground launchers for the Galosh interceptor near Moscow. In 1979, the Soviets began dismantling these above-ground launchers and started the construction of silo launchers for two new missiles--the Gazelle and the SH-11, a modified Galosh. To date, 48 of the original 64 Galosh launchers have been dismantled and 84 new silos constructed, for a total of 100 accountable launchers.

D. SUPPLEMENT TO THE PRESIDENT'S REPORT ON ADHERENCE TO AND COMPLIANCE WITH AGREEMENTS, ENTITLED: "SOVIET ACTIONS IN REGARD TO CERTAIN ASPECTS OF THE SALT I AND SALT II TREATIES"

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY
Washington D.C. 20451

THE DIRECTOR

June 16, 1988

Dear Mr. Chairman:

During my testimony as ACDA Director-designate on March 18, you asked me to provide detailed information on activities by the USSR which relate to obligations of past and present arms control agreements, beginning with SALT I.

On May 17, I sent you a paper discussing Soviet actions which relate to the USSR's obligations in regard to the quantitative limits of the SALT I Interim Agreement, signed in 1972, and the unratified SALT II Treaty, signed in 1979. The paper dealt with the period from the effective dates of obligation through 27 May 1986, when the President decided to end US adherence to SALT I and SALT II. An unclassified version of that paper is enclosed. Material on the ABM Treaty is being provided separately.

The enclosure does not judge whether the Soviets took the actions described in order to comply with these agreements or for other reasons, nor does it address provisions the Soviets have been in compliance with by taking no action.

Information and judgments in the President's series, "Report to Congress on Soviet Noncompliance with Arms Control Agreements," should be considered together with the enclosed in evaluating the record of Soviet arms control behavior.

This material was prepared in coordination with the Department of State, the Department of Defense, the Department of Energy, the Organization of the Joint Chiefs of Staff, and the Intelligence Community.

Sincerely,

William F. Burns

SOVIET ACTIONS IN REGARD TO CERTAIN ASPECTS

of the

SALT I AND SALT II TREATIES

Introduction

This paper describes actions taken by the USSR related to adherence to the provisions of SALT I (Interim Agreement Between the United States and Soviet Union on Certain Measures with Respect to the Limitation of Strategic Offensive Arms) and the unratified SALT II agreement (Treaty Between the United States and the Soviet Union on the Limitation of Strategic Offensive Arms). In particular, it summarizes the specific actions taken to dismantle and replace Soviet weapon systems accountable under these agreements during the period of US adherence to the agreements.

The paper does not address whether arms control obligations changed Soviet force plans that may have existed before the agreements were signed, nor does it address whether the Soviets followed the agreed procedures for dismantlement and destruction. Further, it does not treat circumstances where Soviet inaction had the effect of maintaining compliance.

The enumeration herein of systems accountable for arms control purposes does not necessarily correspond to assessments done for other purposes, such as characterizing Soviet operational or combat-ready forces.

Because of a continuing pattern of noncompliant Soviet behavior, President Reagan decided on May 27, 1986, to end US observance of SALT I and SALT II. The annual Presidential "Report to Congress on Soviet Noncompliance with Arms Control Agreements," last submitted on December 2, 1987, details Soviet actions and should be read in conjunction with this report in evaluating Soviet arms control behavior. These reports show a disturbing pattern of Soviet violation of existing arms control agreements.

Furthermore, SALT I and SALT II did not reduce or control arms but rather allowed expansion of Soviet strategic forces because the strategic nuclear delivery vehicles used as the units of account are only one measure of strategic capability. As the President noted in his August 5, 1986 report, "Interim Restraint: U.S. and Soviet Force Projections":

> "...it is clear that SALT II and I codified a very major arms buildup including a quadrupling of Soviet strategic weapons (warheads and bombs) since SALT I was signed in 1972 and near doubling of Soviet ballistic missile warheads from about 5,000 to more than 9,000 since SALT II was signed in 1979."

The President went on to state that "the SALT I and II agreements, even if fully complied with, would not prevent a very substantial further expansion of Soviet capabilities."

All of the launchers and delivery vehicles dismantled or destroyed during SALT I and II were replaced by new or modernized ones which have improvements in some or all of the militarily significant attributes of throw weight, warhead numbers, range, accuracy, and survivability. This process continues today. For example, the number of Soviet ICBM warheads increased from about 1600 in 1972 to some 6400 now, and SLBM warheads from about 1000 to over 3000. The introduction of the SS-24 and SS-25 mobile systems is improving survivability while maintaining or increasing warhead numbers, and ALCM-carrying heavy bombers are revitalizing the Soviet intercontinental bomber force.

Summary

The SALT I and SALT II agreements allowed deployment of certain new or modernized strategic weapons as long as these deployments did not exceed the limits established by the agreements. As the Soviets deployed new or modernized weapons, they remained within the quantitative limits of SALT I by dismantling or destroying older systems. With respect to the unratified SALT II Treaty, however, the US Government has judged that the USSR exceeded that Treaty's limit on strategic nuclear delivery vehicles (SNDV).

By May 27, 1986, the Soviets had dismantled about:

- -- 300 ICBM silos;
- -- 20 ballistic missile submarines;
- -- 250 SLBM launchers; and
- -- 30 heavy bombers.

All of these systems were replaced with systems having increased capability, such as greater range, throw weight, and number of weapons. The number of weapons, for example, increased from about 5,500 to about 10,000 by May 1986.

* * * * * * *

SALT I (the Interim Agreement) A Protocol to the Interim Agreement stipulated that:

- -- The Soviets must dismantle or destroy an older ICBM or SLBM launcher for each new SLBM launcher becoming

operational above a total of 740 launchers on nuclear-powered submarines.

-- The Soviets may have no more than 950 SLBM launchers and 62 modern ballistic missile submarines.

The Soviet Union reached the threshold limit of 740 in 1975 and began dismantling SS-7 and SS-8 launchers. During 1975 and 1976 the pace of dismantling lagged behind new launchers becoming accountable. In 1977, the Soviets caught up with the requirement and by the end of the year had dismantled the entire force of about 200 SS-7 and SS-8 launchers. The Soviets also began dismantling ballistic missile submarines in 1977 when they reached the ceilings of 950 SLBMs and 62 modern SSBNs. Through May 27 1986, they dismantled 14 Yankee I SSBNs (which counted against the 62 submarine limit and the 950 launcher limit) as well as eight older non-nuclear ballistic missile submarines (which counted only against the launcher limit). These dismantlements resulted in a cumulative reduction of some 250 missile launchers on submarines.

In sum, as of May 27, 1986, the Soviets had dismantled a total of over 450 ICBM and SLBM launchers under SALT I and had replaced these launchers with about 450 launchers for newer SLBMs. The Soviets did not exceed the limit of 62 modern SSBNs and 950 SLBMs during the period.

SALT II If the SALT II Treaty had entered into force, both Parties would have been required to reduce their numbers of strategic delivery vehicles (SNDVs) to 2400 within six months, and to 2250 by January 1, 1981. Although the treaty was not ratified, both the US and the USSR pledged in 1982 not to contravene the provisions of the SALT II Treaty. The US characterized that pledge as an obligation not to exceed a limit of 2504 SNDVs--the number the Soviets declared when SALT II was signed.

From 1979 through May 27, 1986, the Soviets destroyed about 70 SS-11 silos and some 30 heavy bombers. During the same period, the Soviets added to their accountable systems at least 70 SS-25 mobile ICBM launchers and about 60 ALCM-carrying heavy bombers. Although the Soviets stated that they did not exceed 2504 SNDVs, the US judges that the Soviets were consistently above this number beginning in 1984.

SALT II also set limits of 820 MIRV ICBMs; 1200 MIRV ICBMs and SLBMs; and 1320 MIRV ICBMs and SLBMs and ALCM-carrying heavy bombers. The Soviets had not exceeded these limits as of May 27, 1986.

The Soviets agreed in SALT II to dismantle or destroy at least 12 of a set of 18 SS-9 silos at the Tyuratam missile test range within eight months of the Treaty's entering into force; up to six could be converted to test launchers for missiles undergoing modernization. These launchers were not regarded as part of the SALT II SNDV total but were considered by the US to be part of the Soviets' operational forces. The Soviets completed destruction of all 18 launchers in 1985.

E. REPORT BY THE ACTING DIRECTOR OF THE ARMS AND CONTROL DISARMAMENT AGENCY PURSUANT TO SECTION 34 OF THE ARMS CONTROL AND DISARMAMENT ACT, AS AMENDED, ENTITLED: "INF TREATY VERIFICATION: OUR ABILITY TO ASSESS COMPLIANCE UNDER A DOUBLE GLOBAL ZERO"

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

Washington, D.C. 20451

THE DIRECTOR

March 8, 1988

Dear Mr. President:

I am pleased to provide, in accordance with Section 37 of the Arms Control and Disarmament Act, a report entitled "INF Treaty Verification: Our Ability to Assess Compliance Under a Double Global Zero."

The Report analyzes, as the legislation requires, verification of the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of their Intermediate-range and Shorter-range Missiles, signed December 8, 1987.

Sincerely yours,

Manfred Eimer
Acting

INF TREATY VERIFICATION:

Our Ability to Assess Compliance Under a Double Global Zero

(Please note: Some sections of this report were deleted, because they were classified.)

I. Introduction

This report is provided pursuant to Section 37 of the US Arms Control and Disarmament Act, as regards the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of their Intermediate-range and Shorter-range Missiles, signed December 8, 1987.

Section 37 of the US Arms Control and Disarmament Act states in part:

> (a) It is the sense of the Congress that adequate verification of compliance should be an indispensable part of any international arms control agreement. In recognition of such policy and in order to assure that arms control proposals made or accepted by the United States can be adequately verified, the Director shall report to the Congress, on a timely basis, or upon a request by an appropriate committee of the Congress --
>
> > (1) in the case of each element of any significant arms control proposal made to a foreign country by the United States, or made to the United States by a foreign

country, the determination of the Director as to the degree to which such element can be verified by existing national technical means;

(2) in the case of any arms control agreement or treaty that has entered into force, any significant degradation or alteration in the capacity of the United States to verify the various components of such agreement or treaty; ...

(b) For purposes of paragraphs (1) and (2) of subsection (a), the Director shall assume that all measures of concealment not expressly prohibited could be employed and that standard practices could be altered so as to impede verification.

(c) Except as otherwise provided by law, nothing in this section shall be construed as requiring the disclosure of sensitive information relating to intelligence sources or methods or persons employed in the verification of compliance with arms control agreements.

The Administration decided early in the INF negotiations that various on-site measures would be required to ensure effective verification, and these measures are incorporated in the Treaty. Therefore, although Section 37 is couched exclusively in terms of national technical means (NTM), the scope of this report is broader, taking into account all measures that facilitate verification.

In this report, the "degree to which such elements can be verified" is described in qualitative terms that are relative to other arms agreements reached and proposed.

The core assessment of this report is contained in Sections V and VI, "The Degree To Which INF Treaty Elements Can Be Verified" and "Conclusions." In order to clarify the context in which these judgments were reached, the report briefly describes US verification objectives, the over-all verification concept, and the scope and assumptions of the assessment.

II. Verification Objectives

From the outset of the negotiations, the President has insisted on very high standards for verification. Specifically, the US has had three basic verification objectives for the INF agreement:

- To ensure confidence in the agreement.
- To help deter Soviet violation of the Treaty by increasing both the likelihood of US detection and the difficulty to the Soviets of committing an undetected violation.
- To permit timely detection of Soviet violations so that we can take appropriate measures to protect US and Allied security.

To achieve these objectives, the US has developed a comprehensive verification regime embodied in the INF Treaty.

III. The Overall INF Verification Concept

Verification is not an adjunct or after-thought to this Treaty. Rather, the verification concept is woven throughout virtually every article of the Treaty. This is because the US designed its entire Treaty draft with verification in mind and insisted on negotiating verification aspects in parallel with, or as a part of, negotiating other aspects. Many of these verification aspects touched on sensitive issues on both sides so that some decisions were not made until the final stages of negotiations.

The US, in devising its verification concept for INF, proceeded from the assumptions that: 1) Although the Treaty obligates each side to account accurately for all its Treaty-limited items, Soviet declarations for total numbers, locations, and characteristics of their treaty-limited items could be false; and that 2) US intelligence cannot achieve a total "count" of these items. Thus, the US does not rely upon Soviet data to verify numerical limits in the Treaty. Instead, the US employs a two-track verification approach: 1) on-site inspection (OSI) to count the declared or "overt" inventory at declared locations, observe elimination procedures, and confirm the absence of Treaty-limited items at formerly declared facilities; and 2) NTM to detect any illegal non-declared or "covert" treaty-limited items at any non-declared locations.

The INF Treaty regime is designed both to control the overt INF inventory (and eliminate INF entirely after three years) and to make as complicated and costly as possible the retention or acquisition of any illegal covert inventory. This includes seeking to reduce Soviet confidence in the effectiveness of any covert inventory. The Treaty language focuses on the overt inventory, but the bulk of our verification intelligence effort focuses on the covert problem.

The overt inventory is controlled, during the draw-down period, by specific geographical and movement constraints and is confirmed by on-site inspection. The geographical constraints are based on a partitioning of the Soviet Union into limited locations where treaty-limited items are allowed, and a larger residual area where they are prohibited unless in notified transit. In this context, the principal function of NTM is not to "count," but to detect any illegal system. Destruction of the INF systems is observed and confirmed by US inspectors.

[Deleted.]

With this framework and the implementing Treaty provisions, our initial verification confidence will increase with time due to the aging and "enforced" inactivity of any possible covert missile systems.

IV. Scope and Assumptions

This report assesses the degree to which we can verify Soviet compliance with the INF Treaty, assuming (as called for in Section 37) that "all measures of concealment not expressly prohibited could be employed and that standard practices could be altered so as to impede verification." In other words, the report addresses the question, "How well will we know if the Soviets cheat and how costly will it be for the Soviets to cheat in a way designed to avoid detection"?

[Deleted.]

VI. Conclusions

How then, does INF Treaty verification stack up against our goals for effective verification?

1. Deter violations

The verification measures negotiated for this Treaty pose significant risks for the Soviets of US detection, and impose considerable complexity on the Soviets should they seek to violate it to acquire a militarily useful covert force. A Soviet "deception planner" would be expected to adopt a conservative view of his ability to escape US detection of such a violation. He would not know fully and precisely US monitoring capabilities, and he would place a high premium on avoiding accidents and security slips that could result in inadvertent exposure. Thus, to the extent that the Soviets are averse to having their noncompliant behavior exposed, the Treaty's verification goes a long way in deterring violations.

The Soviets must know that they will pay a real price for noncompliance. For example, the US terminated its political commitment to the SALT I Interim Agreement and the SALT II Treaty largely in response to Soviet violations. However, the political will to extract such a price from the Soviets cannot be legislated or negotiated in advance. Nor are there institutional procedures or innovations that can guarantee resolve.

2. Create Confidence in the Agreement

The stringent verification measures we have negotiated are sure to help foster confidence in this agreement. This confidence will grow over time as the effects of the flight test ban and NTM surveillance seriously erode the capability of the Soviets to possess militarily significant INF forces.

3. Permit Timely Detection

In general, the more significant the violation, the greater the risk of detection by the US, and the more difficult for the Soviets to achieve it without detection. For example, it would be much more difficult for the Soviets to maintain a high alert, ready, reliable covert force than an un-exercised, covert stockpile of INF weapons of questionable reliability. In this regard, the double global zero of the INF Treaty offers inherent verification advantages:

- First, after the elimination period, all launch-critical INF equipment will be destroyed and no INF infrastructure (e.g., bases, manufacturing, storage facilities etc.) may be used to conceal or support INF systems.

- Second, the ban on flight testing of INF systems will make it difficult over time to retain a covert force that can be made operationally useful.

- Third, after the reduction phase is complete, the verification task will be solely to detect (not count) mobile INF systems -- a still demanding but much less complicated task than verifying compliance with numerical limits.

Thus, over time, and without any flight testing, we judge it will be increasingly difficult for the Soviets to hide a covert force that can be made operationally useful.

4. Effective, Despite Uncertainties

Despite the rigor of the INF verification regime, there will be the unavoidable uncertainties and ambiguities we have described in our assessment. We must recognize, however, there is no such thing as perfect verification, especially in a treaty involving mobile and sometimes small weapons possessed by a party with a record of noncompliance and whose territory is the largest in the world.

Despite these inevitable uncertainties, I believe that the verification regime negotiated for INF will be effective in permitting us to achieve the considerable benefits offered by the Treaty.

F. REPORT BY THE DIRECTOR OF THE ARMS CONTROL DISARMAMENT AGENCY PURSUANT TO SECTION 31 OF THE ARMS CONTROL AND DISARMAMENT ACT, AS AMENDED, ENTITLED: "CONGRESSIONAL REPORT OF ARMS CONTROL AND DISARMAMENT STUDIES"

UNITED STATES SENATE - OFFICE OF THE SECRETARY
MESSAGES, COMMUNICATIONS, PETITIONS AND MEMORIALS

EC-3634 REFERRED TO COMMITTEE: Foreign Relations SCAP-S116

DATE DELIVERED: JUL 2 8 1988 RECEIVED BY:

A communication from the the Acting Director, U. S. Arms Control and Disarmament Agency, transmitting, pursuant to law, a report on studies relating to arms control and disarmament issues; to the Committee on Foreign Relations.

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY
Washington, D.C. 20451

THE DIRECTOR

July 21, 1988

EC 3634

Dear Mr. President:

Section 4 of the Arms Control and Disarmament Amendments Act of 1987 provides that: "Pursuant to his responsibilities under section 31 of the ACDA Act, and in order to enhance Congressional and public understanding of arms control and disarmament issues, the Director shall provide to the Congress not later than June 30 of each year, a report setting forth -

(1) a comprehensive list of studies relating to arms control and disarmament issues concluded during the previous calendar year by government agencies or for government agencies by private institutions or persons; and

(2) a brief description of each such study."

The complete list of studies in response to this legislative requirement is enclosed, as well as the summaries, exclusive of the Department of Energy's. I will forward summaries pertaining to the Department of Energy studies as soon as we receive them.

Sincerely,

George F. Murphy, Jr.
Acting

UNCLASSIFIED

30-JUN-88

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	1987	TTBT Supplementary Protocols and Technical Annex -- LAWRENCE LIVERMORE NATL. LAB	*NA
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	1987	F-Region Ionospheric Detection of Far Infrasound from Rocket Ascent: Preliminary Results -- LOS ALAMOS NATIONAL LABORATORY	*NA
	1987	Spectral Scaling of Earthquakes in the Miramichi Region of New Brunswick -- SANDIA NATIONAL LAB	*NA
	1987	Seismic Event Detection and Source Location Using Single-Station (Three-Component) Data -- SANDIA NATIONAL LAB	*NA

124 reports. *NA - No abstract for report.

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TITLE: (U) Adherence to and Compliance with Agreements (Pell Amendment Response)

SPONSOR: ACDA IN-HOUSE STUDY: ACDA/VI FEB-87

ABSTRACT: (U) The Soviet Union has in recent years raised a number of compliance charges against the United States. Some of these charges date back over several years, while a few are new. There has been a clear attempt on the Soviet Union's part to invent countercharges in response to legitimate U.S. statements regarding Soviet noncompliance. In all cases, once the issue was clearly defined, the U.S. government has provided full responses that should have removed any doubt that the U.S. was and remains in compliance with all treaty obligations and political commitments.

The President's Report to Congress on Soviet Noncompliance with Arms Control Agreements that covers the period through the end of 1986 details the significant issues involving Soviet noncompliance. Third country actions for the last 6 years inconsistent with their obligations under the 1972 Biological and Toxin Weapons Convention and the 1925 Geneva protocol on Chemical Weapons are a continuing problem.

TITLE: (U) World Military Expenditures and Arms Transfers 1986

SPONSOR: ACDA IN-HOUSE STUDY: ACDA/NWC APR-87

ABSTRACT: (U) This report, the seventeenth in a series by the Arms Control and Disarmament Agency, provides a ready reference on military expenditure, arms transfer and related data for 145 countries. We have continued our effort to provide comprehensive, up-to-date, and accurate data and to include more extensive analyses. New features in this issue include four essays, a new Table IV, which covers both arms deliveries and arms agreements through 1985, and a section, following the Highlights, giving the world rank of all countries for 17 variables.

TITLE: (U) Fiscal Year 1988 Arms Control Impact Statements (ACIS)

SPONSOR: ACDA IN-HOUSE STUDY: ACDA/NWC JUN-87

ABSTRACT: (U) Document is developed and submitted to Congress in accord with Section 36 of the Arms Control and Disarmament Act. ACIS is intended to be of value to the executive branch, the Congress, and the public. It also serves to assist the Congress in evaluating defense programs that may have a significant impact on US arms control policies and negotiations. Major weapons analyzed in the FY 88 cycle included the MX missile, the Trident submarines, the TRIDENT I(C4) missile, the TRIDENT II(D5) missile, the small road-mobile intercontinental ballistic missile, the B1-B bomber program, and the continued development

and procurement of cruise missiles. In addition, an important analysis on SDI was included that discussed the arms control implications of directed energy weapons, kinetic energy weapons, and nuclear-driven directed energy. Finally, the FY88 document directed attention to the Administration's Chemical Warfare programs, including the binary chemical munitions production proposal. All of the programs analyzed were consistent with current US security and arms control policies.

TITLE: (U) President's Report to Congress on Soviet Noncompliance with Arms Control Agreements

SPONSOR: ACDA IN-HOUSE STUDY: ACDA/VI DEC-87

ABSTRACT: (U) At the request of Congress, the President submitted this Report on Soviet Noncompliance with Arms Control Agreements. This report represents another in a series of reports to Congress by this Administration regarding this serious issue. The series includes reports dated January 1984, February and December 1985, March 1987 and the 1984 Report on Soviet Noncompliance prepared by the independent General Advisory Committee on Arms Control. Each of this reports has enumerated and documented, in detail, issues of Soviet noncompliance and U.S. attempts to resolve the issues. This report addresses questions of Soviet noncompliance with existing arms control agreements, including the Anti-Ballistic Missile Treaty, the Biological and Toxin Weapons Convention , the Geneva Protocol on Chemical Weapons, and the Limited Test Ban Treaty. Soviet activities with respect to SALT I and SALT II agreements are not treated in the report. Nor is the Threshold Test Ban Treaty. The provisions of the Helsinki Final Act that relate to military security and confidence-building have been superseded by the Stockholm Document, a development that is treated.

TITLE: (U) TTBT Compliance Tests: an Application of Empirical Bayes

SPONSOR: ACDA PERFORMING ORGANIZATION: PACIFIC-SIERRA RES. CORP. JAN-87

ABSTRACT: (U) This report is part of a continuiing research effort sponsored by the DARPA and ACDA to resolve technical issues concerning verification of nuclear test ban treaties.

Statistical procedures used to test Soviet compliance with the 150 KT threshold test ban (TTB) are reviewed, and a new procedure based on empirical Bayes methods is presented. Empirical Bayes, a hybrid of conventional and Bayesian statistics, weakens assumptions regarding the "prior" distribution used in the standard Bayes treatment of the TTB problem.

TITLE: (U) International Safeguards for a Modern MOX Fuel Fabrication Plant

SPONSOR: ACDA PERFORMING ORGANIZATION: LOS ALAMOS NATIONAL LABORATORY MAR-87

ABSTRACT: (U) This report, prepared for DOE, addresses safeguards issues relevant to materials accountancy and International Atomic Energy (IAEA) verification activities at a modern mixed-oxide (MOX) fuel fabrication facility under IAEA safeguards. This work is an extension of an earlier study done in FY'85 under the sponsorship of ACDA. The earlier study was limited to identifying key elements of IAEA safeguards at a modern MOX fuel fabrication facility that could detect abrupt diversions.

Bulk-handling facilities that process plutonium for commercial fuel cycles offer considerable challenges to nuclear materiel safeguards. Modern fuel fabrication facilities that handle mixed oxides of plutonium and uranium often have large inventories of special nuclear materials in their process lines and in storage areas for feed and product materials. In addition, the remote automated processing prevalent at new MOX facilities, which is necessary to minimize radiation exposures to personnel, tends to limit access for measurements & inspections. The facility design considered in this study incorporates all these features as well as state-of-the-art measurement technologies for materials accounting. Key elements of IAEA safeguards for such a fuel cycle facility have been identified in this report, and several issues of primary importance to materials accountancy and IAEA verifications have been examined. We have calculated detection sensitivities for abrupt and protracted diversions of plutonium assuming a single materials balance area for all processing areas. To help achieve optimal use of limited IAEA resources, we have calculated sampling plans for attributes/variables verification. We have dem

onstrated the usefulness of calculating standard deviation(MUF-D) and detection probabilities corresponding to specified material-loss scenarios and resource allocations.

TITLE: (U) Appendix A for SNAP/D Users Manual

SPONSOR: ACDA PERFORMING ORGANIZATION: SYSTEMS ENVIRONMENTS CORP. MAR-87

ABSTRACT: (U) This product is an appendix for "SNAP/D, Seismic Network Assessment Program for Detection" which describes the new operating instructions for the VAX version and specification of the improvements made by Systems Environment Corporation. SNAP/D is a computer model designed by Pacific Sierra Research Corporation for assessing the ability of a network to detect and locate seismic events (i.e., earthquakes or explosions).

TITLE: (U) Analysis of Nuclear Test Limitations

SPONSOR: ACDA PERFORMING ORGANIZATION: PACIFIC-SIERRA RES. CORP MAY-87

ABSTRACT: (U) Pacific Sierra Corporation is researching various aspects of the impact of lower nuclear yield thresholds on U.S. and Soviet capabilities. This study provides a reference for policymakers on the effects of three possible nuclear test limits. It is a final report under a contract funded by DARPA and administered by ACDA.

TITLE: (U) IAEA Safeguards Experience at CE-W

SPONSOR: ACDA PERFORMING ORGANIZATION: COMBUSTION ENGINEERING, INC. MAY-87

ABSTRACT: (U) During Oct. 1983 to Nov. 1985, twelve inspections were conducted by the IAEA at Combustion Engineering (Windsor) fuel element fabrication facility. For these inspections, the IAEA was present at the plant a total of 36 calendar days and used 121 mandays of inspection effort. This paper describes the inspection activities carried out and offers recommendations for improving inspections.

TITLE: (U) Alternative Approaches to Arms Control

SPONSOR: ACDA PERFORMING ORGANIZATION: BDM Corporation JUN-87

ABSTRACT: (U) BDM examined 18 "less formal agreements" (LFAs) since 1945 in its study of alternative approaches to formal treaties. They found that generally LFAs have served best as a means for implementing arms control confidence building-measures rather than for more restrictive arms control measures. BDM's main finding was that "centrality to national security" has been the most important factor in shaping less formal agreeements. On the other hand, LFAs with low centrality to national security can involve real constraints, long-term endurance, minimal complexity and more relaxed verification requirements.

BDM was also tasked to attempt to apply lessons learned in their study to current negotiations. Regarding LFAs for NST, BDM concluded that the main possible application of LFAs to the current negotiations would be a Vladivostok type framework agreement in START and/or D&S if the sides were unable to reach more formal treaty arrangements.

TITLE: (U) Safeguards Implementation in Countries of Proliferation Concern -- Progress Reports: March, 1987 and June, 1987

SPONSOR: ACDA PERFORMING ORGANIZATION: DOE/MARTIN MARIETTA JUN-87

ABSTRACT: (U) Progress is reported for the second and third quarters of FY 1987 on Martin Marietta Energy System, Inc.'s research and development activities on domestic and international safeguards for uranium enrichment plants. This work is sponsored in part by ACDA.

TITLE: (U) Application of General Linear Models to Event Yield Estimation

SPONSOR: ACDA PERFORMING ORGANIZATION: BATTELLE, PACIFIC N.W. LAB SEP-87

ABSTRACT: (U) This report describes magnitude/yield modeling and seismic yield estimation from the perspective of "general linear models" (GLM). Network models both proposed in research and current seismic yield-estimation methodology can be reformulated in terms of GLMs which allows efficient maximum likelihood solution of the yield-estimation problem. Reformulation shows similarities and differences and provides a focus for improved yield estimation as a combination of good features of current methodologies and research to eliminate common deficiencies.

A specific GLM-based methodology is recommended for seismic yield estimation. Novel aspects include: event coupling and azimuth dependent station micro-corrections modeled as random effects, and magnitude measurements from several phases and/or multiple distinct instruments at the same recording site. NTS magnitude data from a WWSSN network are used to illustrate the recommended methodology.

Though mathematically elegant and computationally intensive, the recommended methodology can be implemented on VAX class computing systems using readily available software. Results to date suggest that GLM analysis of extensive calibration data would result in an improved seismic yield estimation methodology.

This report is part of a research effort funded by DARPA.

TITLE: (U) A Technical Review of the Unified Yield Estimates

SPONSOR: ACDA PERFORMING ORGANIZATION: PACIFIC-SIERRA RES. CORP SEP-87

ABSTRACT: (U) This report is part of a continuing research effort sponsored by DARPA and ACDA to resolve technical issues concerning verification of nuclear test ban treaties.

The unified yield estimate (UYE) introduced in a recent DARPA report by Dr. Ralph W. Alewine,is evaluated within a rigorous framework. Particular attention is paid to performance of the UYE at yields well below the current 150 KT threshold test ban limit.

TITLE: (U) Second Conference on Stability and the Offense Defense Relationship

SPONSOR: ACDA PERFORMING ORGANIZATION: SPC (and SAIC) SEP-87

ABSTRACT: (U) This project addresses issues about crisis stability both during and after the transition from the present offensive dominated world to one in which deterrence is based on greater reliance on defenses. This report of the second conference held on this subject, in July 1987, summarizes presentations by scientists/analysts from national laboratories, technical research centers and government contractor organizations. Subjects addressed include arms control issues; Soviet perspectives; stages of a transition; and alliance perspectives.

TITLE: (U) Detection and Identification Needs for Low Yield Threshold Test Ban Treaties

SPONSOR: ACDA PERFORMING ORGANIZATION: PACIFIC-SIERRA RES. CORP DEC-87

ABSTRACT: (U) This study on the detection and identification needs for Low Yield Threshold Test Ban Treaties (LYTTBT) addresses the problems of monitoring these treaties with seismic networks both external and internal to the Soviet Union. The external networks begin with the current Atomic Energy Detection System (AEDS) network and expand it to meet increasing treaty threshold limitations.

This report is part of a research effort funded by DARPA.

TITLE: (U) Further Studies of Seismic Variability at the Shagan River Test Site

SPONSOR: ACDA PERFORMING ORGANIZATION: S-CUBED DEC-87

ABSTRACT: (U) Large samples of teleseismic P wave data recorded from Shagan River underground explosions have been systematically analyzed in an attempt to develop a better quantitative undesstanding of the sources of mb variability observed for these explosions. Results indicate that large differences in station-corrected mb residuals between explosions in close proximity are associated with changes in the near-source P wave propagation paths to teleseismic distances. Projection of the mb residuals from seismic stations

in continental Europe back into the corresponding P wave initiation area near the source reveals the existence of an anomalous volume of materiel located northwest of the test site at a depth of about 100 km. This anomalous volume apparently defocuses energy out of paths to certain stations and redirects this energy into the paths to other stations.

In some cases, the observed patterns of mb residual variation can be correlated with similar patterns of variation in either spectral composition, coda complexity or arrival times of the P wave signals. The sense of these variations is such that enhanced high frequency energy, decreased coda complexity and delayed arrival times are all associated with a positive shift in the mb residuals.

This report is part of a research effort funded by DARPA.

TITLE: (U) Anti-Tactical Ballistic Missile (ATBM) Systems in the Context of the ABM Treaty

SPONSOR: ACDA PERFORMING ORGANIZATION: SYSTEM PLANNING CORPORATION DEC-87

ABSTRACT: (U) The ABM Treaty restricts ABM systems, or systems to counter strategic ballistic missiles, but not ATBMs, or defenses against shorter-range, non-strategic ballistic missiles. However, negotiators need not specify precisely what constitutes a strategic ballistic missile or how, based on its technical capabilities, an ABM can otherwise be distinguished from an ATBM system. Based on a review of previous work, this analysis recommends that that the power-aperture product (PA) of the battle management radar and the average velocity (W) of the interceptor, together with the product (PA)W**3, be used to measure ABM capability. The analysis also suggests that tests against ballistic objects with speeds exceeding 3 km/sec be considered ABM tests. Both of these quantities, but especially the latter one, might profitably be negotiated with the Soviets as agreed interpretations of Treaty terms. One advantage to the testing limit is that it could apply to defensive systems using non-radar sensing technologies that may emerge from the SDI. Three SDI technology programs for sensors and one for ground-based interceptors would appear to have applications for both ABMs and ATBMs. However, no inherent technical distinctions between such ABM or ATBM components appear verifiable.

TITLE: (U) Teleseismic Waveform Modeling Incorporating the Effects of Known Three-dimensional Structure Beneath the Nevada Test Site

SPONSOR: DARPA PERFORMING ORGANIZATION: MASS. INSTITUTE OF TECHNOLOGY JAN-87

ABSTRACT: (U) The focusing and defocusing of teleseismic P waves predicted by a known (Taylor, 1983) three-dimensional structure beneath the Nevada Test Site is calculated by dynamic ray tracing and superposition of Gaussian beams. The 20 to 100 km scale lengths of this model, having velocity fluctuations of several per cent, account for a factor of three fluctuations in the azimuthal pattern of P amplitudes. Assuming that scattering processes are concentrated in the crust and uppermost mantle beneath the source and receiver, the integrated energy in the P coda should be more stable than direct P, because it tends to homogenize the effect of focusing/defocusing structure near the source for scattering into direct P near the source. For direct P scattering near the receiver, however, even the late coda is not capable of completely removing the effects of focusing/defocusing near the source.

TITLE: (U) Amplitude and Phase Data Inversions for Phase Velocity Anomalies in the Pacific Ocean Basin

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERSITY OF SOUTHERN CALIF. JAN-87

ABSTRACT: (U) Rayleigh wave phase velocities at periods 30-80 s in the Pacific Ocean are calculated by inverting phase and amplitude anomaly data using the paraxial ray approximation and the Gaussian beam method.

TITLE: (U) Theoretical and Empirical Investigations of Regional Phase Behavior

SPONSOR: DARPA PERFORMING ORGANIZATION: S-CUBED FEB-87

ABSTRACT: (U) We have followed a research program designed to (1) improve theoretical understanding of the generation and propagation of regional phases and (2) identify additional regional phase data from well-controlled sources which can be used to test discriminant measures. We have further refined the NTS model and have shown the multiple near-surface layering enhances both Pg and Lg phases, while increasing Qb relative to Qa in the model strengthens Lg relative to Pg signals. These NTS models with increased layering and increased Qb tend to produce regional seismograms which better match observed signals particularly for explosion sources at large ranges. For the Fennoscandian region a modification of the locked-mode program was used to develop spectral estimates of regional P-wave signals to frequencies of 25 Hz. Spectral analyses of were performed on the high quality regional phase signals for a selected sample of earthquakes near NTS and explosions of comparable magnitudes.

TITLE: (U) Spectral Evidence for Source Multiplicity in Explosions

SPONSOR: DARPA PERFORMING ORGANIZATION: ENSCO FEB-87

ABSTRACT: (U) Spectral and cepstral analysis were performed on regional-array NORESS recordings of mining explosions in Scandinavia and Russia in order to detect the effects of delayed explosions on "ripple firing" commonly used in mine-blasting practice. NORESS stack spectra were computed in windows on Pn, Pg, Sn, and Lg by averaging individual channel spectra, frequency by frequency, across the array. The stack spectra were then corrected for instrument response and noise. For comparison, spectra were also computed for six western Norway earthquakes located near the Blasjo and titania Norwegian mines.

TITLE: (U) Regional Network: Seismicity of Asia: and Frequency-Dependent Q

SPONSOR: DARPA PERFORMING ORGANIZATION: LAMONT-DOHERTY GEOLOGICAL FEB-87

ABSTRACT: (U) A method is developed for the computation of body-wave synthetics which is suitable to a medium having smooth variation with depth and anelasticity having arbitrary variation with frequency. The method is applied to an anelastic earth model where Q is assumed to follow a power-law frequency dependence. The outcome is a pulse shape with properties quite different from what might be expected if the familiar constant-Q pulse shapes are surveyed. The seismicity of Soviet Central Asia is studied using Soviet catalogs, and the relationship between topography and seismicity is analyzed using digital terrain data. The seismicity is concentrated along the major topographic gradients dividing the distinct physiographic/tectonic provinces of the region, with relatively low activity in both high plateaus and low basins and higher activity along with flanks of mountainous areas. Further, there is a distinct relationship between sesimic activity and active salt diapirism.

TITLE: (U) Source Depths Utilizing Broad band Data

SPONSOR: DARPA PERFORMING ORGANIZATION: RONDOUT ASSOCIATES MAR-87

ABSTRACT: (U) This report covers the effort of a two year research project to improve our ability to discriminate between nuclear explosions and earthquakes based on the depth of an event determined from local and regional phases. The approach taken has been to improve phase identification and picking abilities for depth phases pP and sP through adaptive filtering to reduce effects of mode conversion and scattering. Three-component polarization methods are applied to broad-band digital data. It was found that depths could be determined fairly reliably but that complicated source time functions can lead to misidentification of the depth phases and consequently incorrect depth estimates. The second phase of the project applied the methods developed using the well constrained events of the NE US to Ocean Sub-bottom Seismometer data from the Kuril/Kamchatka area.

TITLE: (U) Finite-Difference Modeling of Seismological Problems in Magnitude Estimation using Body Waves, Surface Waves, and Seismic Source Imaging

SPONSOR: DARPA PERFORMING ORGANIZATION: TELEDYNE-GEOTECH MAR-87

ABSTRACT: (U) Our work has focused on the effects of near-source heterogeneity upon seismic magnitude-yield determination. The basic tool in this work has been a developing 2-dimensional linear finite-difference code which computes the dynamic elastic response of an earth model to specified initial conditions. By using various initial conditions and the reciprocity theorem, we can generate the linear response of the earth model to a general seismic source. Major modifications in the code include t he addition of general free-surface boundary conditions capable of handling topography at any angle, as well as the fundamental mode Raleigh wave packet adequate for numerical studies.

TITLE: (U) Yield estimation

SPONSOR: DARPA PERFORMING ORGANIZATION: PACIFIC-SIERRA RESEARCH CORP. MAR-87

ABSTRACT: (U) The report addresses means to improve the estimate of the yield of underground nuclear explosions using remote measurements. A statistical approach compares several independent means for a specific test site. The effect of ejecta on seismic yields is also addressed.

TITLE: (U) A Spectral Method for Computing Complete Synthetic Seismograms

SPONSOR: DARPA PERFORMING ORGANIZATION: CIRES MAR-87

ABSTRACT: (U) The efficient computation of complete solution synthetic seismograms for flat, plane layered, laterally homogeneous elastic media and for high frequency bandwidths is a problem which has received considerable attention in the field of solid-earth geophysics. A new method is presented which is based upon a spectral representation of the solution of the elastic wave equation. The eigenvalue and eigenfunction are reformulated in a manner which avoids the numerical instabilities. Comparisons of the results of the locked mode aproximation with exact results obtained from other synthesis methods are presented.

TITLE: (U) Investigations of Eurasian Seismic Sources and Upper Mantle Structure

SPONSOR: DARPA PERFORMING ORGANIZATION: MASS. INSTITUTE OF TECHNOLOGY MAR-87

ABSTRACT: (U) The first section describes the observations of first-order mantle reverberations and develops techniques for using these data to constrain upper-mantle velocity and attenuation structure. The second section discusses our work on the waveform inversion of higher-mode surface waves, and the third analyzes the resolving power of the higher mode data set. The fourth section reviews recent progress in seismic tomography and its implications for mantle dynamics. The fifth section applies methods for the representation and recovery of seismic source parameters to two recent earthquakes.

TITLE: (U) Source Depths Utilizing Broad Band Data

SPONSOR: DARPA PERFORMING ORGANIZATION: RONDOUT ASSOCIATES MAR-87

ABSTRACT: (U) This report covers the effort of a two year research project to improve our ability to discriminate between nuclear explosions and earthquakes based on the depth of an event determined from local and regional phases. The approach taken has been to improve phase identification and picking abilities for depth phases pP and sP through adaptive filtering to reduce effects of mode conversion and scattering. Three-component polarization methods are applied to broad-band digital data. It was found that depths could be determined fairly reliably but that complicated source time functions can lead to misidentification of the depth phases and consequently incorrect depth estimates. The 2nd phase of the project applied the methods developed using the well-constrained events of the NE US to OSS data from the Kuril/Kamchatka area.

Polarization filtering reduced much of the P coda and emphasized discrete portions of the wave terrain as anticipated. However, the unique position of the OSS, well below the sea bottom, presented problems. The sea-bottom reflection added downgoing waves to the usual upgoing wave field and inhibited the use of the angle of incidence as a method of identifying phases.

TITLE: (U) Forward and Inverse Modeling of Near-Field Seismic Waveforms From Underground Nuclear Explosions for Effective Source Functions and Structure Parameters

SPONSOR: DARPA PERFORMING ORGANIZATION: WOODWARD-CLYDE CONSULTANTS APR-87

ABSTRACT: (U) It is well established that near field records of nuclear explosions can be analyzed to obtain detailed information about the seismic source function and its dependence on yield. This information is generally formulated in terms of parameterized models for the RDP and for the test size crustal structure. This study reviews the results of forward modeling studies to obtain the source and structure parameters for Pahute Mesa. Near-field data sets from several nuclear explosions were studied and it was shown that if non-linear crustal material response occurs it does not have a significant effect on data interpretation.

TITLE: (U) Effects of Pore pressure, Fractures, and Dilatency on Ground Motion in Granite

SPONSOR: DARPA PERFORMING ORGANIZATION: S-CUBED APR-87

ABSTRACT: (U) A series of small scale explosive experiments in dry and saturated fractured granite samples have been conducted at SRI. These show a strong effect of initrial pore pressure and saturation on measured ground motions. Quasistatic material properties tests on similar samples are now in progress. Results of dynamic experiments were analyzed and numerical simulations were compared with data from explosions.

TITLE: (U) Lg Magnitudes of Degelen, East Kazakhstan, Underground Explosions

SPONSOR: DARPA PERFORMING ORGANIZATION: ST. LOUIS UNIVERSITY APR-87

ABSTRACT: (U) Lg magnitudes were determined by a process using stations on the Eurasian landmass. Inspite of the large distances from stations in Norway, a good estimate of magnitude was obtained.

TITLE: (U) Velocity Structure of silent Canyon Caldera,Nevada Test Site

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERSITY OF CALIFORNIA APR-87

ABSTRACT: (U) A laterally averaged one dimensional P and S wave velocity structure is obtained for Silent Canyon Caldera, located beneath Pahute Mesa at the Nevada Test Site. The velocity models are derived from a linearized damped least squares travel time inversion for slowness gradient perturbations. The inversion produces a model which velocity for P waves increases from 1.5 km/sec at the surface to 4.5 km/sec at 2.3 km depth and from 1.0 km/sec at the surface to 2.3 km/sec at 2.0 km depth for S waves. The P and S-wave models produce travel time residuals which are typically less than 0.1 and 0.2 sec, respectively, which is within observational error.

TITLE: (U) Propagation and Excitation of Lg, Sn, and P-Pn Waves from Eastern United States Earthquakes by Regression Analysis of RSTN Data and Seismic Attenuation Studies of U.K. Arrays

SPONSOR: DARPA PERFORMING ORGANIZATION: TELEDYNE-GEOTECH MAY-87

ABSTRACT: (U) By applying regression analysis to amplitudes of the regional phases Pn, Sn and Lg in various frequency ranges we have derived the attenuation rates, extrapolated source spectra, and relative site responses for these phases in Eastern North America using RSTN data.

TITLE: (U) MSS Project Final Report: Comparison of Borehole, OBS, and Hydrophone S/N and detection Capabilities from Three Pacific Sites

SPONSOR: DARPA PERFORMING ORGANIZATION: SIERRA GEOPHYSICS MAY-87

ABSTRACT: (U) Comparative analyses of observed phases, ambient noise levels, waveform characteristics, SNR, and detection capabilities were performed on select data sets or compiled for the Marine Seismic System (MSS) borehole seismometer, its associated bottom hydrophone, and the Scripps Institution of Oceanography's OBSs at the Tonga Basin site, the Ocean Sub-bottom Seismometer at a northwestern Pacific site and the Wake island bottom hydrophone array in the western Pacific.

TITLE: (U) Teleseismic Waveform Modeling Incorporating the Effects of Known Three-dimensional Structure Beneath the Nevada Test Site

SPONSOR: DARPA PERFORMING ORGANIZATION: MASS. INSTITUTE OF TECHNOLOGY JUN-87

ABSTRACT: (U) The pattern of teleseismic amplitudes from underground nuclear tests has been found to have strong variations as a function of location within a test site. Forward modeling of body waves in known three-dimensional structures beneath seismic sources is used to investigate the effects of such structures on teleseismic amplitudes and to determine the structural resolution necessary to formulate amplitude corrections for variations in source site and recording networks. A known structure beneath Pahute Mesa, Nevada Test Site may be used to formulate amplitude corrections that may reduce the variance in a yield estimate by 25 percent. Magnitudes based on measurements of coda amplitudes or integrated energy flux in a time window following and including the direct P phase can reduce the fluctuations within the observations by a seismic network, but will be only partially successful in reducing the effects of near-source structure.

TITLE: (U) Analysis of Near-Source Contributions to Early P-Wave Coda for Underground Explosions. I. Waveform Complexity

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERSITY OF MICHIGAN JUN-87

ABSTRACT: (U) An extensive data set of more than 1600 teleseismic short-period waves from 46 underground explosions is analyzed to establish near-source contributions to the first 15 sec of the P signals. The near-source components are isolated by event-to event comparisons of first-cycle magnitudes, RMS amplitudes in the first 5 and next 10 sec of the waveforms, and energy temporal centroid measurements. The Amchitka events show variations betwen direct arrival and P coda amplitudes that are similar to the Pahute Mesa data, which can be attributed to focusing and defocusing associated with the subducting Aleutian slab. Novaya Zemlya events exhibit a strong inverse relation between waveform complexity and event size, as well as having much lower early coda amplitudes relative to the direct P arrivals than the Nevada Test Site events. There is very little evidence of significant tectonic release contribution to either a direct P arrivals or early P coda for any of the test sites.

TITLE: (U) Regional Wave Attenuation and Seismic Moment from the Inversion of NORESS Spectra

SPONSOR: DARPA PERFORMING ORGANIZATION: SCIENCE APPLICATIONS, INC. JUL-87

ABSTRACT: (U) Frequency-dependent regional wave attenuation along continental paths to the NORESS array in Norway is investigated. Regional Lg and Pn spectra from 190 events, at distances between 200 and 1300 km, have been inverted for seismic moment and apparent attenuation. Our method uses both the spectral and spatial decay of observed signal amplitudes to separate source and path contributions.

TITLE: (U) Lg Wave Excitation and Propagation in Presence of One-, Two, and Three-Dimensional Heterogeneities

SPONSOR: DARPA PERFORMING ORGANIZATION: ST. LOUIS UNIVERSITY JUL-87

ABSTRACT: (U) The scattering of *Lg* waves by point heterogeneities in a crustal waveguide is considered. Computer simulations lead to

inferences of the behavior of the scattering mechanism which helps understand observed facts about the shear wave coda, especially the relationship between the lag time at which measurements are made and the inferred coda Q. A second study reports on problems in some routine processing techniques used for long period surface wave analysis. The influence of spectral shape on inferred spectral amplitudes is discussed.

TITLE: (U) Surface and Near-Source Effects on Seismic Waves--
Theory and Borehole Seismometer Results

SPONSOR: DARPA PERFORMING ORGANIZATION: OREGON STATE UNIVERSITY AUG-87

ABSTRACT: (U) A simple plane wave model is adequate to explain many surface versus borehole seismometer data sets. Using such a model, we present a series of examples which demonstrate the effects of the free-surface, near-surface velocity gradients, and low-impedance surface layers on the amplitudes of upcoming body waves.

TITLE: (U) Technical Report for the Period 1 April - 30 June 1987

SPONSOR: DARPA PERFORMING ORGANIZATION: SCIENCE APPLICATIONS, INC. AUG-87

ABSTRACT: (U) This report summarizes work on topics described in the Center R&D plan and subsequent guidance from DARPA. Two technical notes on network capability, and two reports on research to improve analysis of regional seismic data are included.

TITLE: (U) Average Q and Yield Estimates from the Pahute Mesa Test Site

SPONSOR: DARPA PERFORMING ORGANIZATION: WOODWARD-CLYDE CONSULTANTS AUG-87

ABSTRACT: (U) Attenuation models, with and without frequency dependence, have been developed through analysis of time-domain amplitude measurements and teleseismic spectral shape data from Pahute Mesa nuclear explosions. The time-domain analysis is based on a near-field to far-field amplitude comparison. The near-field amplitude information is incorporated in two parameterized explosion source models based on analyses of near-field data.

TITLE: (U) Analysis of Near-Source Contributions to Early P-Wave Coda for Underground Explosions. II. Frequency Dependence

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERSITY OF MICHIGAN AUG-87

ABSTRACT: (U) An analysis of dispersion in more than 1600 teleseismic short-period P waves from 46 underground explosions has established that near-source effects are responsible for systematic frequency-dependent variations observed in the first 15 sec of the P signals. Explosions from the Nevada, Amchitka, and Novaya Zemlya test sites exhibit a common magnitude dependence of the dispersive behavior, with smaller events having relatively enriched low-frequency (0.4 to 0.8 Hz) energy in the coda. For the Nevada and Amchitka sites, the larger events have relatively enhanced high-frequency (0.8 to 1.1 Hz) energy in the coda as well, which may actually be a consequence of diminished high frequency content of the direct arrivals. A likely explanation for the dispersive behavior is a combination of relatively enhanced surface wave excitation and scattering for shallower events, and frequency-dependent defocusing for sites overlying anomalous high-velocity structures, as is the case for both Pahute Mesa and Amchitka.

TITLE: (U) Effect of Low Q Sediments and Crustal Q on Lg Attenuation in the United States

SPONSOR: DARPA PERFORMING ORGANIZATION: ST. LOUIS UNIVERSITY AUG-87

ABSTRACT: (U) Q values for Lg and its coda exhibit significant lateral variations accross the United States, some of which correlate with known variations in the thickness of shallow sedimentary layers. The possibility that all variations in the Lg attenuation are caused by changes in the thickness of shallow sediments is investigated by computing multi-mode synthetic seismograms for crustal models with various thicknesses of low-Q sediments.

We find that the variation of Lg Q values between the Appalachian and Rocky Mountains can easily be produced by varying accumulations of sandstone and shale of Mesozoic age and younger. By contrast, throughout most of the western United States, neither the low Lg Q values which have been observed nor the regional variation of those values can be explained by accumulations of low-Q sediments. Instead, their explanation appears to require low and laterally varying values of Q in the crystalline crust.

TITLE: (U) Geophysical Investigations at Pahute Mesa, Nevada

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIV OF TEXAS AT DALLAS AUG-87

ABSTRACT: (U) The seismic response of nuclear tests at Pahute Mesa, NV displays variations which correlates with the geologic/ geophysical structure. Investigations have been performed using borehole, gravity and wide-angle seismic observations, with the aim of producing a geophysical model of the Silent Canyon caldera structure at Pahute Mesa. Empirical models of the density and seismic velocity have been formulated based on well logs. New gravity stations were obtained in 1985 and merged with older, lower quality data. A new gravity modeling technique was developed and applied to the modeling of a transect of across the area. The resulting model supports the hypothesis that a high density and velocity "basement" composed of Silent Canyon caldera rocks underlie a lower density and velocity blanket at a depth of a few kilometers. In 1986, a wide angle seismic reflection/refraction survey was completed near the gravity profile. The 15 km long line crossed the buried caldera boundary as well as important normal faults. The shot point was located on outcropping basement. Future interpretation of the combined gravity and seismic data should permit the construction of a predictive geophysical model.

TITLE: (U) Center for Seismic Studies Database Structure, Version 2.8

SPONSOR: DARPA PERFORMING ORGANIZATION: SCIENCE APPLICATIONS, INC. SEP-87

ABSTRACT: (U) This document updates and extends the definition of the seismic database structure maintained at the center for Seismic Studies and other DARPA sponsored organizations.

TITLE: (U) A Procedure for the Joint Inversion of Regional and Teleseismic Long-Period Body Waves

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERISTY OF ARIZONA SEP-87

ABSTRACT: (U) A Procedure for the joint inversion of regional and teleseismic long-period waveforms for source parameters is presented. Three test cases demonstrate that the inclusion of regional distance seismograms to a data set of teleseismic observations stabilizes the inversion process and adds valuable constraints to the source parameter estimates, particularly when the teleseismic Green's functions are inadequate. The added stability and constraints from regional waveforms can be attributed to the robust nature of regional distance Green's functions, as well as the added coverage of focal sphere that regional data provide.

TITLE: (U) Depth of Faulting During the 1968 Meckering, Australia, Earthquake Sequence Determined from Waveform Analysis of Local Seismograms

SPONSOR: DARPA PERFORMING ORGANIZATION: PENNSYLVANIA STATE UNIVERSITY OCT-87

ABSTRACT: (U) Waveforms for 11 forfeshocks and 48 aftershocks of the Ms 6.8 Meckering earthquake recorded at the World-Wide Standard Seismograph Network station Mundaring are analyzed to determine the depth distribution of faulting during this unusual intraplate earthquake sequence.

TITLE: (U) The Meckering Earthquake of 14 October 1968: A Possible Downward Propagating Rupture

SPONSOR: DARPA PERFORMING ORGANIZATION: PENNSYLVANIA STATE UNIVERSITY OCT-87

ABSTRACT: (U) Average source parameters of the 1968 Meckering, Australia earthquake are obtained by the inversion of body waves. The objectives of the inversion are the elements of the moment tensor and the source-time history. Two finite fault models of the earthquake are presented, with rupture initiating at a point (1) near the top of the fault and (2) at the bottom of the fault.

TITLE: (U) Attenuation and Backscattering from Local Coda

SPONSOR: DARPA PERFORMING ORGANIZATION: MASS. INSTITUTE OF TECHNOLOGY OCT-87

ABSTRACT: (U) Coda decay and excitation for local events were examined at Mammoth Lakes and Morgan Hill, California, Monticello, South Carolina, and New Brunswick, Canada, in the frequency range of 3 to 50 Hz. The single scattering theory of attenuation and coda generation was used to interpret the data. The backscattering turbidity, which is controlled solely by scattering, and the total apparent turbidity at Monticello both show a minimum around 10 Hz. This correlation between coda excitation and decay indicates that a substantial portion (at least 50 percent) of coda Q in this case is due to scattering. All of the scattering observed in this study probably occurs in the crust. Reverberation under the station cannot be excluded for most codas, but the existence of two types of Coda at Monticello and New Brunswick demonstrates that this cannot be the dominant mechanism at these sites.

TITLE: (U) Analysis of Near-Source Contributions to Early P-wave Coda for Underground Explosions. III. Inversion for Isotropic Scatterers

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERSITY OF MICHIGAN OCT-87

ABSTRACT: (U) A systematic array processing analysis is applied to 916 teleseismic short-period P-wave signals from 25 underground explosions at Pahute Mesa in order to establish whether coherent arrivals scattered from near-source velocity heterogeneity can be identified. The Pahute Mesa data show some evidence for enhanced scattering contributions to the first 15 sec of the P-wave signals from the western edge of the Silent Canyon Caldera.

TITLE: (U) Lg Wave Propagation in the Laterally Varying Crust and the Distribution of the Apparent Quality Factor in Central France

SPONSOR: DARPA PERFORMING ORGANIZATION: SOCIETY RADIOMANA NOV-87

ABSTRACT: (U) The aim of this study is to evaluate the sensitivity of Lg waves to lateral changes of the earth's structure. Considering a simple model of uplift of the Moho, numerical simulations show that the geometrical attenuation of Lg is not much affected by a smooth anomaly of the Moho depth. On the other hand, the passing of the Lg wave through the region of the Moho uplift results in a clear deterioration of the wave shapes, which confirms the occurrence of mode converions. We use a data set consisting of records of Lg phases in France to test the conclusions of our numerical study. The mapping of the apparent quality factor, computed from Lg at different frequencies, confirms the interpretation of the strong attenuation of S waves around 1 Hz in terms of scattering and shows the weak sensitivity of the amplitude of Lg to smooth changes in the depth of the Soho.

TITLE: (U) Observations of Transvers Energy for P Waves Recorded on a Deep-Ocean Borehole Seismometer Located in the N.W. Pacific

SPONSOR: DARPA PERFORMING ORGANIZATION: UNIVERSITY OF HAWAII DEC-87

ABSTRACT: (U) The T/R energy ratio, a transverse fraction of energy, is observed in the initial part of the P-wave train and can be measured by separating the P-wave energy into its radial (lying in the sagittal plane) and transverse vectorfs. The data consist of P-wave signals recorded on a borehole seismometer and explosion-source data recorded on the North American continent.

TITLE: (U) Radiation Characteristics of Elastodynamic Line Sources Buried in Layered Media with Periodic Interfaces. I. SH-Wave Analysis

SPONSOR: DARPA PERFORMING ORGANIZATION: PENNSYLVANIA STATE UNIVERSITY DEC-87

ABSTRACT: (U) Using the T matrix method, or the extended boundary condition, the solution for a class of problems involving a SH line source in an elastic wave guide is determined. Analysis of the scattered fields at the surface, and of the fields radiated into the half-space, shows complicated field behavior, even with sinusoidal free surface corrugation. These results are directly applicable to regional wave propagation and scattering.

TITLE: (U) Radiation Characteristics of Elastodynamic Line Source Buried in Layered Media with Periodic Interfaces. II. P- and SV-Wave Analysis

SPONSOR: DARPA PERFORMING ORGANIZATION: PENNSYLVANIA STATE UNIVERSITY DEC-87

ABSTRACT: (U) A method for determining the elastodynamic (P and SV waves) radiation characteristics of finite-size sources buried in horizontally layered media, having periodically corrugated interfaces, is described. Numerical results are given to delineate the various features of the field diffracted into the elastic half-space, as well as the displacement field induced on the traction-free boundary of the elastic plate. The specific example examined is directly related to regional wave propagation in a continental crustal wave guide.

TITLE: (U) How Thick are the Continents

SPONSOR: DARPA PERFORMING ORGANIZATION: MASS. INSTITUTE OF TECHNOLOGY DEC-87

ABSTRACT: (U) Fundamental and higher-mode Rayleigh waves propagating across northern Eurasia and the western Pacific Ocean have been used to construct a lower bound on the maximum depth extent of seismic velocity differences between old continents and old oceans. The waveform inversion procedure of Lerner-Lam and Jordan has been modified to search for optimum path-average elastic models whose significant structural differences are "squeezed" above some chosen depth. The high-velocity zones underlying the ancient cratonic nuclei are inferred to be part of the tectosphere, translating coherently with the continents during plate motions. This and other studies of upper mantle structure are more consistent with the thick plate, compositionally stratified model of the cratons than with the conventional thin plate models of continental thermal structure.

TITLE: (U) Comparisons of Nuclear-TNT Equivalences and Effects Environments in Different Geologic Media

SPONSOR: DNA PERFORMING ORGANIZATION: CALIFORNIA RESEARCH & TECHN. JAN-87

ABSTRACT: (U) The basic issue of equivalency between nuclear and high explosive energy sources has been with nuclear effects community since the advent of nuclear energy sources. The first main objective of this paper is to calculationally examine the amount of energy coupled into different types of geologic media by nuclear and TNT sources. The second main objective is to compare the ground shock effects that result from TNT and nuclear sources in different geologic media. An underlying objective of this paper and its appendices is to identify and to examine some of the key issues associated with the use of conventional explosives to produce different types of nuclear environment.

TITLE: (U) Minor Scale Cratering & Ejecta Predictions, Comparisons With post-Shot Data

SPONSOR: DNA PERFORMING ORGANIZATION: CALIFORNIA RESEARCH & TECHN. FEB-87

ABSTRACT: (U) This report summarizes the results of two pre-shot prediction calculations of a DNA field test. These results include cratering dynamics, ground shock and ejecta mechanics.

TITLE: (U) Early Smoke Plume and Cloud Formation by Large Area Fires

SPONSOR: DNA PERFORMING ORGANIZATION: PACIFIC-SIERRA RESEARCH CORP. MAY-87

ABSTRACT: (U) It is likely that a nuclear burst over an urban area would cause a large number of fires burning simultaneously over hundreds of square kilometers. The atmospheric heating produced by these fires would result in low-level convergence over a broad region and a highly buoyant upward mass flux over the fire, lofting large quantities of smoke and moisture to high altitudes.

This report presents the results of highly resolved numerical calculations describing the early-time cloud and smoke plume formation by large city fires. The simulations show that atmospheric moisture contributes significantly to plume evolution through latent heat release. The model indicates that early scavenging of smoke particles by precipitation is likely to reduce the amount of smoke injected into the upper atmosphere. A principal result is that plume rise is controlled primarily by fire intensity and atmosheric stratification rather than fire size.

TITLE: (U) Nuclear Winter Source-term Studies
Volume V - A Preliminary Analysis of Soviet Urban Areas

SPONSOR: DNA PERFORMING ORGANIZATION: PACIFIC-SIERRA RESEARCH CORP. JUL-87

ABSTRACT: (U) A preliminary analysis of Soviet urban geography.